

# LET'S COMPUTE!

99p

Secret  
message  
maker!

START TO  
BUILD YOUR  
OWN DATABASE

For **ALL** users  
of the Electron,  
BBC Micro, PC,  
Amiga, C64/128,  
Archimedes,  
Amstrad CPC,  
Atari ST and  
Spectrum

No 4 November 1990  
A Database Publication



Do-it-yourself Bonfire Hangman



# JUDGE DREDD

I AM THE LAW



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Send secret messages  
to your friends!

**GOTO 25**

**NEW!**

Start building the  
Let's Compute!  
database

**GOTO 6**

CHEATS!  
CHEATS!  
CHEATS!

**GOTO 38**

Play this  
**SCORCHING**  
version of  
Hangman!

**GOTO 16**

Many more  
prizes to be won!

**GOTO 9, 43**

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## REGULARS

Final Front Ear  
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How a Computer Works  
Keyboard Kapers  
Logo Lowdown  
Program Doctor

**GOTO 8**  
**GOTO 11**  
**GOTO 14**  
**GOTO 18**  
**GOTO 20**  
**GOTO 27**  
**GOTO 35**  
**GOTO 41**



The third issue of *Let's Compute!* is brilliant. My favourite is the Witches' Brew program.

But some of the drinks it prints out have had very odd names. I haven't dared try them yet.

I've had names ranging from a JAREMOUBASIKATOSEFUX to a BUZE. Booze is a great name for a drink.

Some of the names have been even funnier. But I daren't write them down here.

Keep up the good work. I hope you print lots more short, fun programs like that soon.

— Paul Bailey, Didsbury

I think *Let's Compute!* is brill, fantastic, amazing and excellent.

Please could you tell me where I can buy a Roamer like the competition prizes in the preview issue? Also, how much does it cost?

— James Clark (11), Tonbridge, Kent.

**The Valiant Roamer costs £89.95. You can also get lots of bits and pieces to go with it.**

**Details from Valiant Technology, Gulf House, 370 Old York Road, Wandsworth, London SW18 1SP. Phone 071-874 8747**

# Notice

**If you have any tips for other readers, send them in. And if you have any questions about your computer or software just ask us. We'll try to answer them on the Noticeboard.**

**Let us know what you want to see in future issues. And if we use your letter or ideas we'll send you a *Let's Compute!* baseball hat!**

**Send your letters to**



***Let's Compute!*  
Europa House,  
Adlington Park,  
Macclesfield  
SK10 4NP.**

**Remember to tell us your age.**

I received Turtle Logo with my club membership pack for the BBC Micro. I already know some commands like FD, BK, RT and LT, but could you please help me with some others?

First, I would like to save my programs. I've tried: SAVE "TURTLE" but it doesn't work.

Also, I can't find out how to print my programs. Should I use PRINT?

— Anna Kucyj, Kingsbridge, Devon.

**You've used the SAVE command for Basic. The instruction in Logo is slightly different. You only need one quote and a space is important.**

**So, to save your program, type:**

SAVE "MYPROG

**You shouldn't use TURTLE as a name because if you're using a disc it would replace the one on it that's already called that.**

**PRINT isn't for listing your program in Logo. It's for printing things out. The *Let's Compute!* turtles will showing how to do this in future issues.**

**Turtle Logo won't let you list your program on paper. But you can see and change a procedure that you set up with, say:**

TO LOOP

**All you need to do is type:**

EDIT "LOOP

**Next month the turtles in Logo Lowdown explain SAVE and PRINT.**

**Turtle Logo is a simple introduction to Logo for *Let's Compute!* readers. But it doesn't have ALL the features of the complete Logo language.**

**If you want those you need something like Logotron Logo. There are money-off vouchers for that in your club pack.**

## Computer Shows coming soon...

Want to see the latest computers in action? Buy new games or hardware? Or just get some friendly advice?

Then don't miss the Computer Shopper Show. It's at Wembley from Thursday, December 6, to Sunday, December 9.

It's the biggest computer show of the year and an ideal place to do your Christmas shopping. You can find out more about it on page 44.

And if you live in the Manchester, Stockport or Wilmslow area you can travel to London cheap on the Saturday. As part of a fund-raising campaign to build a new hut, 1st Heaton Moor Scout Group have arranged a day trip to London.

It only costs £16 for adults and £10 for children. So you can visit London and see the show for much less than the usual price of a day out in London.

For more details of the train, ring Beryl Hornby (061-442 9573) or leave a message on 061-443 2211 ext 710 (24 hr).

● Watford Electronics are holding an Open Day on Sunday, November 4. It's at their shop in Watford High Street and we'll be there. So if there's anything you'd like to find out or tell us about *Let's Compute!* it's an ideal chance.



# Board

The Games Magic series is brill. I'm really enjoying building my own game. But when I ran the version I created in issue 2 it didn't give any sounds or score. Yet when I defined my own clocks it worked well.

Can you please explain this?

Also, when I typed in the Issue 3 listing I got an error message: Array at Line 850. So I took out the part of the line that uses arrays and left just the GOSUB 1840.

The game then worked perfectly

— Alan Pugh (14), Wimbledon

**Line 720 of the listing in Issue 1 sets p% and q% to the position of the corner of the clock. If the clock is narrow you need to add a bit to p%.**

**So if you change  $p\% = (X\% + x\%) * 64$  to  $p\% = (X\% + x\%) * 64 + 8$  the clock that is in Issue 2 will be detected. The part of the program that finds the clock is different in Issue 3 so now you're up to there you needn't worry about it.**

**You were right to remove that bit of line 1840 – it was accidentally left in.**

## Competition Results

We had an amazing response to the T-Shirt Designer Competition in the September issue of *Let's Compute!*

There were some excellent designs to choose from. The first four prize winners will all be receiving a set of special colour ribbons PLUS a set of special pens which will allow them to transfer their designs to their T-Shirt.

The four top winners are: Ben Moulton, Grantham; Colin Bracegirdle, Heaton Mersey; Alexander Grumbley, Amesbury; and M Chaoman, Wenhaston.

The next 24 entries will get sets of the pens.

## Alphabet Artist Winners

This month's five lucky winners who'll be receiving a copy of Art Studio from Impact Software are:

Roderick Begbie (13), Tillicoultry, Clackmannanshire – an eagle

Sean Cardus (14), Runcorn, Cheshire – a clown

Thomas Lord (11), Huddersfield, Yorkshire – a man

James Jagger (12), Welton, Lincoln – a lorry

Gregory Pearson (11), Westbury-on-Trym, Bristol – Rom and Ram

● If you haven't sent in your entry yet there's still time. But hurry up! The closing date is November 30.

● And remember, there's an impressive certificate for EVERY entry. Please enclose a large sae so we can send it to you.

● There were entry forms in the first two issues of *Let's Compute!* But if you haven't got one just send your entry with your name, address and age clearly written on a piece of paper.

## HIGH SCORE CHALLENGE!

Game	Computer	Score	Name	Age
Goldrunner	Atari ST	205,800	John Butters	13
Danger UXB	BBC	252,290	Janet McKnight	12
Pipemania	Archimedes	22250	James Peters	10
Jet Boot Jack	Atari 800XL	98050	Jane Emery	9
E-Type	Archimedes	243418	Matthew Short	14
Wings of Fury	Amiga	73,120	Nick Green	15
Atommix	Amiga	38210	John Kennedy	11

If you want to see YOUR name on the high score table, just fill in and post the coupon below. Post it to High Scores, *Let's Compute!* Europa House, Adlington Park, Macclesfield SK10 4NP.

We'll print the best.

### High score challenge

Name .....

Address .....

Age .....

Computer .....

Game ..... Score .....

Game ..... Score .....

Game ..... Score .....

Game ..... Score .....

## Superior Software Competition Winners!

We asked you to choose five answers to questions about football in the September issue of *Let's Compute!*

There were lots of correct entries.

Four first prizes of Subbuteo sets are on their way to:

Chris Penfold (10), Crawley; Anne Bushell (12), Poole; James Hayward (7), Rochester and Richard Johnson (8), Benton.

Runners up prizes of that superb football game, Superior Soccer, go to: David Chisnell (8), North Bersted; R Williams (14), Batley; Paul Solecki (13), Chesterfield; David Ashworth (13), Horwich; Stephen Threlfall (13), Horsham; Peter Philip (13), Chelmsford; Jonathan Rawle (11), Kidderminster; James Squire (13), Cambridge; Ewen McIntosh (8), Haddington; Colin Pursell (8), Eastham; Timothy Mansfield (9), Bristol; Jamie Radford (14), Swansea; Christopher Butler (15), Stourbridge; James Gaynor (14), Wimbledon Village; James Allen (12), New Eltham; Stephen Judd, Pottton; Ryan Wilson-Parker (11), Glasgow; Michael Jones (13), Newcastle Emlyn; Ceri Jones (10), Rhiwbina and Gordon Blake (14), Dunstable.



**BUILD YOUR OWN DATABASE**

**BUILD YOUR OWN DATABASE**

**BUILD YOUR OWN DATABASE**

**BUILD YOUR OWN**

**BUILD YOUR OWN**

*Who needs a database?  
We all do! Over the  
next few months  
Let's Compute! is  
going to show you  
how easy it is to  
build your own.*

# ON THE CARDS

**We are surrounded by databases! You may not realise it but we use them all the time.**

**Have you ever had to use the phone book to find out the number of a friend? This is a kind of database - it's a list of names, addresses and numbers.**

**You have probably seen teletext - Ceefax and Oracle - on your TV. Hundreds of pages can be called up by pressing a few buttons.**

**There is a wide variety of information on teletext. It ranges from jokes to the latest news. But it's just another kind of database.**

**What would YOU use a database for? You can keep a record of your favourite football team's results. Or a list of the names of the songs on your cassettes.**

**If you collect anything - stamps, toy cars, records, cards, stickers and so on - you need to keep track of what you've got. The best way to do this is with a database.**

**It's easy to create your own database on pieces of paper. Just collect the information and write it down. But it's much more fun to use your computer.**

**Paper is easily lost. And it can take quite a long time to search for the item you need.**

**But you can do it in a flash if you have a database**

**in your computer. And that's what we're going to make over the next few months.**

**It will be like a card index file. You'll have about 51 "cards" and you can write down anything you want on them.**

**Then, if you want, you'll be able to sort them into alphabetical order. This will make it really easy to find any card you want.**

**You'll be able to store them on tape or disc so they can be used again and again. And you'll be able to print them out. So you can always have an up to date written copy of your cards.**

**How do you use your database? You start by choosing what you want to do from a list on your screen. This is called the menu. It will look like the panel above.**

**So let's begin building our database. And the first thing we need to create is the menu. That is what this month's program does.**

**Type it in and then SAVE it on tape or disc. Then you can RUN it and have a look at the things you'll be able to do with your computerised database.**

**Try picking one of the choices. All you need to do is type in the number of the one you want.**

**At the moment nothing useful will happen. In fact you'll just get an error message telling you that lines are missing!**



# DATABASE BUILD YOUR OWN DATABASE BUILD YOUR OWN DATABASE

```

10 REM Card Index Database
20 REM By Roland Waddilove
30 DIM C$(255)
40 FOR X=1 TO 255
50 LET C$(X)="*"
60 NEXT X
70 REM ===== MAIN MENU =====
80 CLS
90 PRINT " CARD INDEX DATABASE"
100 PRINT "-----"
110 PRINT
120 PRINT "1. Load a box of cards"
130 PRINT "2. Save a box of cards"
140 PRINT "3. Read/search for a card"
150 PRINT "4. Write on a new card"
160 PRINT "5. Throw away old cards"
170 PRINT "6. Change something on a card"

```

```

180 PRINT "7. Print the cards"
190 PRINT "8. Sort the cards into order"
200 PRINT "9. Stop the program"
210 PRINT
220 LET N=0
230 FOR X=1 TO 251 STEP 5
240 IF C$(X)="*" THEN LET N=N+1
250 NEXT X
260 PRINT "Cards free=";N;" / Cards used=";251-N
270 PRINT
280 PRINT "What do you want to do?"
290 INPUT "Please type in a number (1-9)";N
300 CLS
310 IF N=9 THEN END
320 ON N GOSUB 1000,2000,3000,4000,5000,6000,7000,8000
330 GOTO 70

```

## CARD INDEX DATABASE

1. Load a box of cards
2. Save a box of cards
3. Read/search for a card
4. Write on a new card
5. Throw away old cards
6. Change something on a card
7. Print the cards
8. Sort the cards into order
9. Stop the program

Cards free=45/Cards used=6  
What do you want to do?  
Please type in a number (1-9)

## IS THIS YOUR COMPUTER?

### Electron/BBC/Archimedes/ CPC/PC (GW-Basic)

The program works as shown

### Amiga (Amos)

Change Line 80 to:  
80 MODE 0:KEY OFF:HIDE

### Atari ST (Stos)

Change Line 80 to:  
80 CLS:HIDE

### Spectrum

Select 48k mode  
Change or add the following lines:

```

30 DIM C$(255,32)
35 DIM B$(32):LET B$="*"
240 IF C$(X)=B$ THEN LET N=N+1
310 IF N=9 THEN STOP
320 GOSUB N*1000

```

### Commodore 64/128

Enter the program in capitals  
Change CLS in lines 80 and 300 to:  
PRINT CHR\$(147);

## How it works

First, the program tells the computer to save room in its memory for the cards.

It's called DIMension-ing the array C\$. In this will be held all the information on the 51 cards.

It's dimensioned to 255 so that each card can use five of the memory areas reserved by the DIM.

Next, the menu is printed on the screen. An INPUT command is then used to find out which choice you've asked for.

The number that you type in is held in N and the command on Line 260 will make the program jump to the right subroutine.

All we've got to do now is put the subroutines into the program. We'll start doing that next month.

## NEXT MONTH

We'll start adding the missing lines. And then you'll be able to begin writing your cards



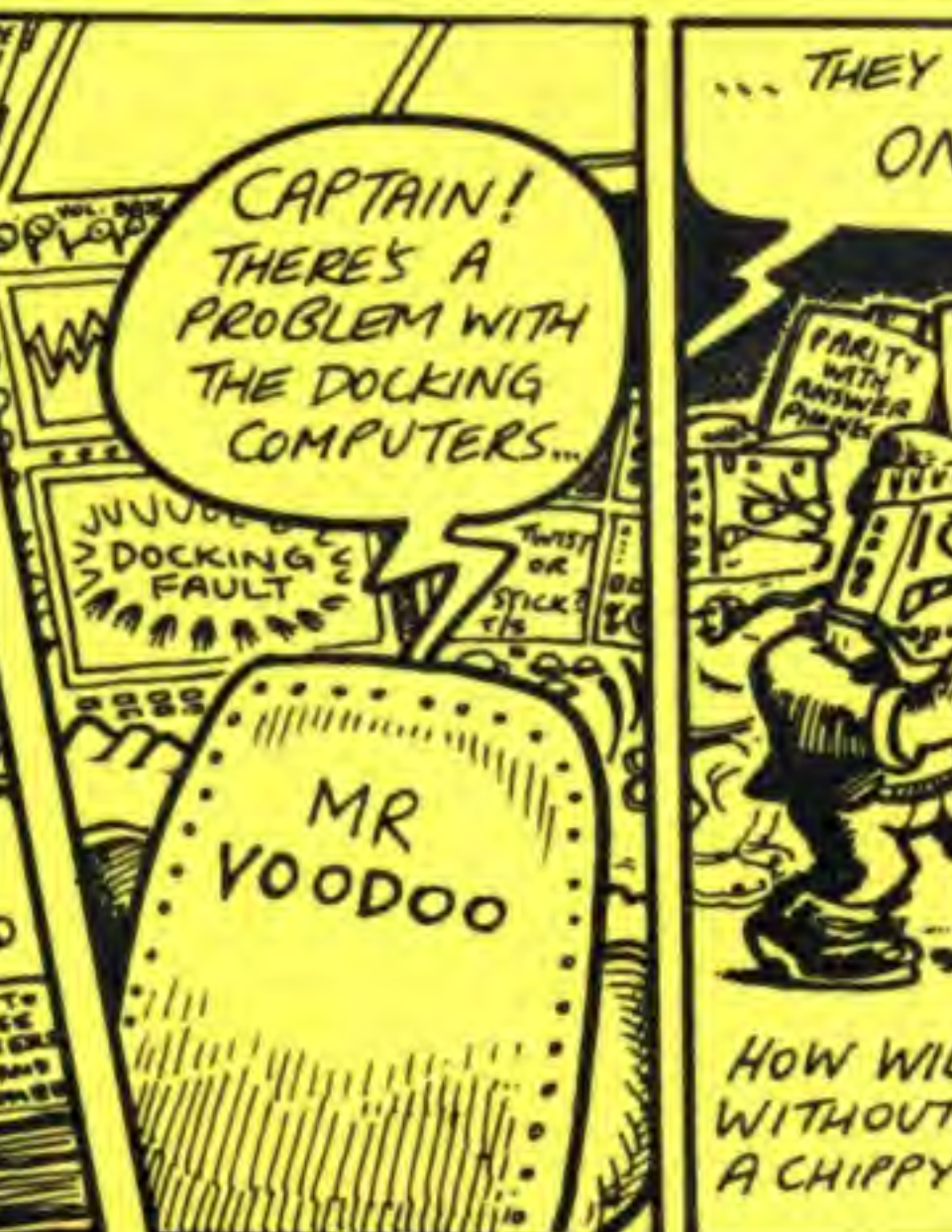
# FIRST THE LEFT EAR, THEN THE RIGHT EAR, AND NOW THE FINAL FRONT-EAR



THE CREW ARE STILL SEARCHING FOR THE OTHER HALF OF THE SHIP...



AND SO THE CREW OF THE USELESS-S-ENTERPRISE-ALLOWANCE ARE THRUST INTO WARPED SPACE -





# Over £350 of Cumana Disc Drives to be Won!

Calling all users of the BBC, Electron (with Plus 1), Archimedes, PC, ST and Amiga! YOU could be one of four lucky readers to win a spanking brand new disc drive for your computer.

They all take 3.5in discs\* and come complete with all the necessary leads. They're ideal to upgrade your tape system. And if you already use discs, here's your chance to add another drive.

## What you have to do

All you must do to win a superb new disc drive is answer the five questions below. Then fill in the entry form and send it to **Let's Compute!** before **November 20, 1990**.

\* If you are a BBC or Electron owner and want a 5.25in drive note this on your entry form.

## THE QUESTIONS

1 What does MSdos stand for?

- a) Microsoft Disc Operating System
- b) Most Standard Disc Operating System
- c) Microsoft's Disc Only System

2 Why are keyboards known as Qwerty?

- a) They are made by a company called Qwerty
- b) They are the first six letters on a keyboard
- c) Mr. Qwerty invented keyboards

3 In which country did Atari and Commodore start?

- a) Great Britain
- b) Germany
- c) USA

4 IBM has a nickname. Which one is it?

- a) The Big Yellow
- b) The Big Blue
- c) The Big Apple

5 Each letter in the word Basic stands for a word. What are they?

- a) Beginners All purpose Symbolic Instruction Code
- b) Best and Simplest Instruction Code
- c) Beginners And Students Information Circuitry



## Cumana Contest Entry Form

If I win, I'd like a disc drive for my:

- ☐ BBC\*
- ☐ Electron\*
- ☐ Atari ST
- ☐ Commodore Amiga
- ☐ Archimedes
- ☐ IBM PC compatible
- \* ☐ I'd prefer a 5.25in drive

### Answers

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_
- 5 \_\_\_\_\_

Name .....

Address .....

Postcode .....

Tel .....

Age .....

Send this to: Cumana Contest,  
Let's Compute!, Europa House,  
Adlington Park, Macclesfield  
SK10 4NP.

Watch out for all the  
winners' names in  
**Let's Compute!**



# TURBOSOFT

TOP MOVERS	SPEC		AMS		C64	
TITLE	Cass	Disc	Cass	Disc	Cass	Disc
Adidas Football	9.99	12.99	N/A	N/A	9.99	12.99
Batman Movie	7.99	11.99	7.99	11.99	7.99	11.99
Bloodwych	7.99	11.99	7.99	11.99	7.99	11.99
Bomber	8.99	N/A	6.99	8.99	6.99	8.99
Castlemaster	7.99	11.99	7.99	11.99	7.99	11.99
Chase HQ	7.99	11.99	7.99	11.99	7.99	11.99
Back to the Future 2	8.99	11.99	8.99	11.99	8.99	11.99
Cricket Master	6.99	11.99	6.99	11.99	6.99	11.99
DDT	7.99	11.99	7.99	11.99	7.99	11.99
Dragon Ninja	7.99	11.99	7.99	11.99	7.99	11.99
Emlyn Hughes	7.99	11.99	7.99	11.99	7.99	11.99
Football Director	6.99	N/A	6.99	N/A	6.99	N/A
Ghouls n Ghosts	7.99	11.99	7.99	11.99	7.99	11.99
Gunship	7.99	11.99	7.99	11.99	7.99	11.99
Hammerfist	4.99	N/A	4.99	7.99	4.99	N/A
Hostages	7.99	11.99	7.99	11.99	N/A	N/A
Hammerfist	4.99	N/A	4.99	7.99	4.99	11.99
International 3D Tennis	7.99	N/A	7.99	11.99	7.99	11.99
Impossamole	7.99	11.99	7.99	11.99	7.99	11.99
Jack Nicklaus Golf	N/A	N/A	7.99	12.99	7.99	12.99
Klax	7.99	11.99	7.99	11.99	N/A	N/A
Kick Off 2	7.99	11.99	7.99	11.99	7.99	11.99
Lords of Chaos	7.99	11.99	7.99	11.99	7.99	11.99
Laser Squad	4.99	N/A	4.99	7.99	4.99	N/A
Manchester United	6.99	10.99	6.99	10.99	6.99	10.99
Microprose Soccer	7.99	11.99	11.99	14.99	11.99	14.99
New Zealand Story	7.99	11.99	7.99	11.99	7.99	11.99
Op T Bolt	7.99	11.99	7.99	11.99	7.99	11.99
Oriental Games	11.99	14.99	11.99	14.99	11.99	14.99
Pipemania	7.99	11.99	7.99	11.99	7.99	11.99
Project Stealth Fighter	7.99	11.99	N/A	N/A	11.99	14.99
Robocop	7.99	11.99	7.99	11.99	7.99	11.99
Rainbow Islands	7.99	11.99	7.99	11.99	7.99	11.99
Shadow Warriors	7.99	11.99	7.99	11.99	7.99	11.99
Sim City	8.99	12.99	8.99	12.99	8.99	12.99
Stunt Car Racer	7.99	11.99	7.99	11.99	7.99	11.99
Strider	7.99	11.99	7.99	11.99	7.99	11.99
Turrican	7.99	11.99	7.99	11.99	7.99	11.99
Time Machine	7.99	11.99	7.99	11.99	7.99	11.99
Treble Champions	7.99	N/A	7.99	11.99	7.99	11.99
Turbo Outrun	7.99	11.99	7.99	11.99	7.99	11.99
Tast Drive 2 The Duel	7.99	11.99	7.99	11.99	7.99	11.99
World Championship Boxing Manager	7.99	N/A	7.99	11.99	7.99	11.99
X Out	7.99	11.99	7.99	11.99	7.99	11.99

SPECIAL OFFERS	SPEC		AMS		C64	
TITLE	Cass	Disc	Cass	Disc	Cass	Disc
APB	3.99	N/A	3.99	N/A	3.99	N/A
Afterburner	3.99	N/A	N/A	7.99	3.99	N/A
Brian Cloughs	3.99	7.99	3.99	7.99	3.99	7.99
Barbarian II	3.99	N/A	3.99	N/A	3.99	N/A
Crackdown	4.99	N/A	4.99	N/A	4.99	N/A
Chuck Yeager	2.99	6.99	2.99	6.99	2.99	6.99
Dragon Spirit	3.99	N/A	3.99	N/A	3.99	N/A
Emotion	4.99	N/A	4.99	N/A	4.99	N/A
Football Manager 2 * Exp	6.99	9.99	6.99	9.99	6.99	9.99
F15 Strike Eagle	6.99	N/A	6.99	11.99	6.99	11.99
Galaxy Force	1.99	N/A	1.99	3.99	1.99	N/A
Ghosts n Goblins	2.99	N/A	2.99	N/A	2.99	4.99
Ghost Busters II	3.99	6.99	3.99	6.99	N/A	N/A
Hunt for Red October	6.99		8.99	9.99	6.99	7.99
Hard Drivin'	3.99	7.99	3.99	7.99	N/A	N/A
Mr Men	4.99	N/A	4.99	N/A	4.99	N/A
Hot Rod	3.99	N/A	3.99	N/A	3.99	N/A
Myth	4.99	N/A	4.99	7.99	N/A	N/A
Ninja Spirit	4.99	N/A	4.99	7.99	4.99	N/A
P47 Thunderbolt	4.99	11.99	4.99	11.99	4.99	11.99
Pacland	4.99	7.99	4.99	7.99	4.99	7.99
Pacmania	4.99	7.99	4.99	7.99	N/A	7.99
Running Man	4.99	7.99	4.99	7.99	4.99	N/A
SDI	1.99	N/A	N/A	N/A	1.99	N/A
Sonic Boom	3.99	N/A	3.99	4.99	3.99	N/A
Skate or Die	2.99	6.99	2.99	6.99	2.99	6.99
Starwars	6.99	N/A	6.99	N/A	6.99	N/A
Time & Magic	4.99	N/A	4.99	N/A	4.99	4.99
Tusker	4.99	N/A	4.99	7.99	4.99	N/A
Vendetta	4.99	N/A	4.99	7.99	4.99	7.99
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Better Spelling 9-14	N/A	N/A	8.99	13.99	N/A	N/A
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6-8	7.99	11.99	7.99	9.99	7.99	11.99
8+	7.99	11.99	7.99	9.99	7.99	11.99
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German Master	6.99	9.99	6.99	9.99	N/A	N/A

TOP MOVERS	AST	Amiga
TITLE		
Apprentice	N/A	19.99
Battlechess	17.99	17.99
Corporation	N/A	17.99
Chase HQ	14.99	17.99
Damocles	14.99	14.99
Dragons Breath	18.99	18.99
Emlyn Hughes	12.99	12.99
Escape from Singes Castle	N/A	26.99
F29 Retaliator	17.99	17.99
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Falcon Mission Disc 2	13.99	13.99
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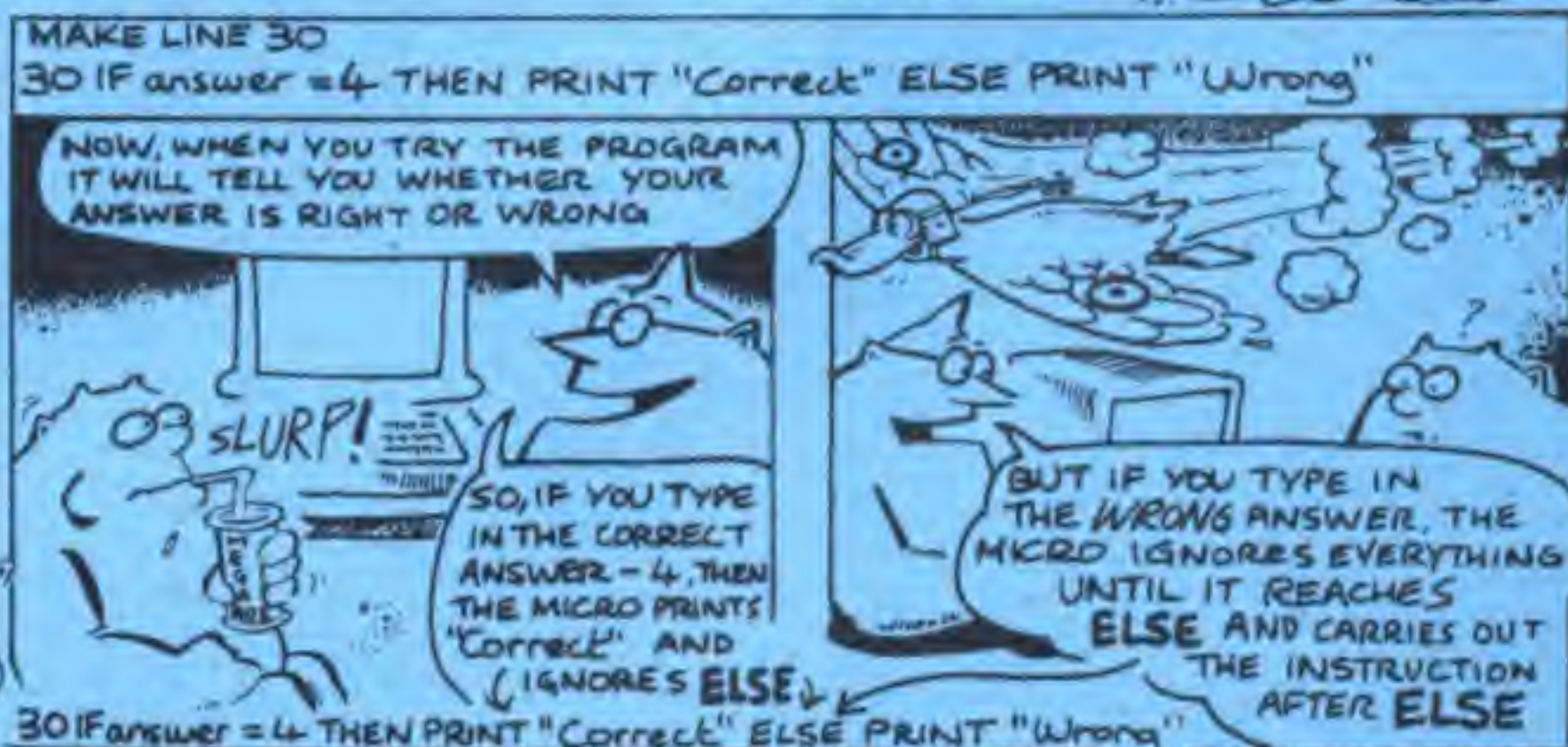
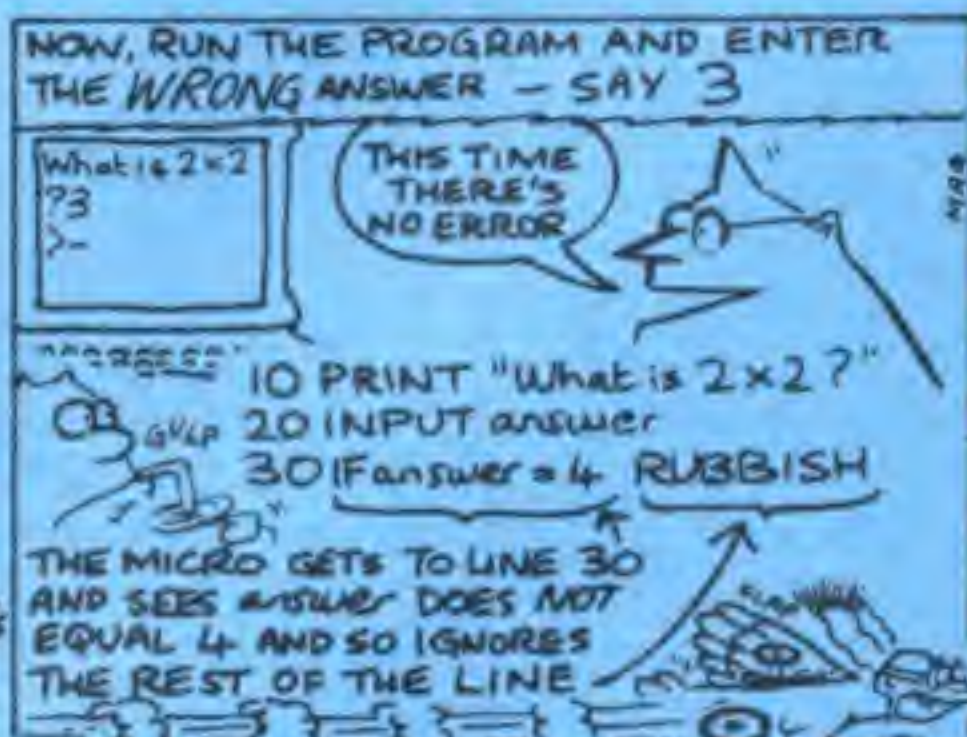
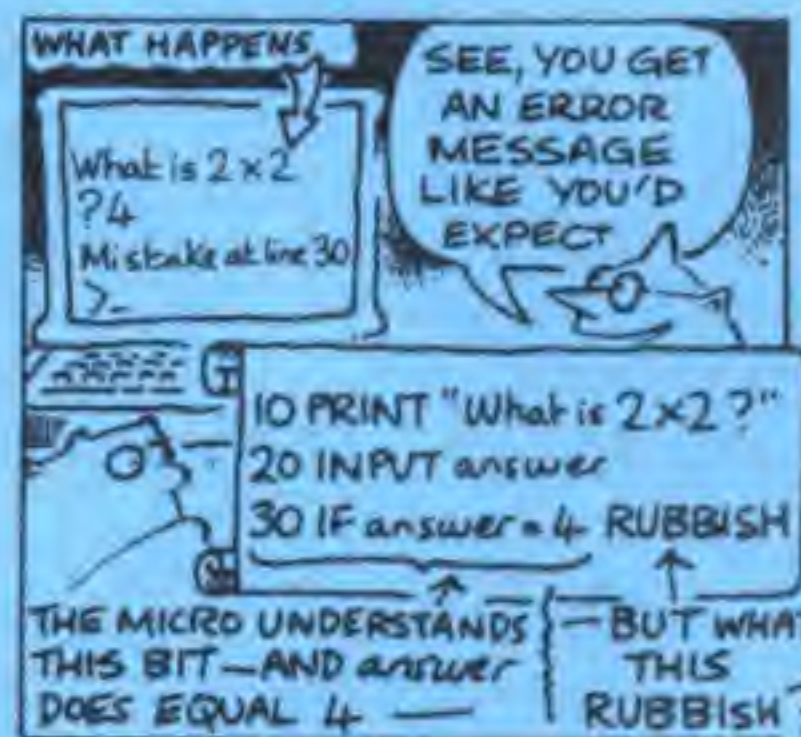
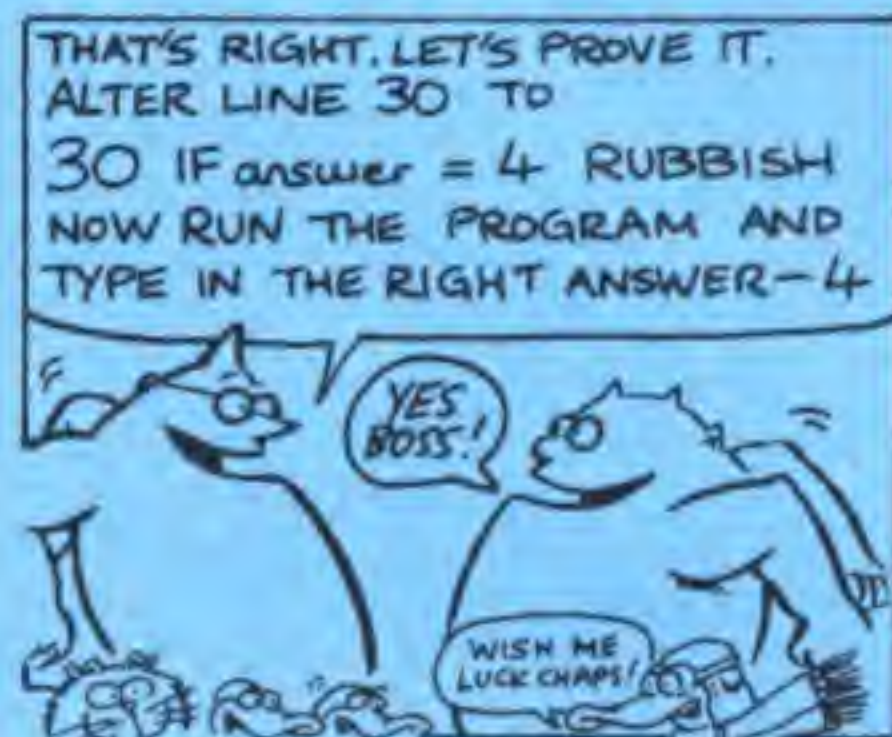
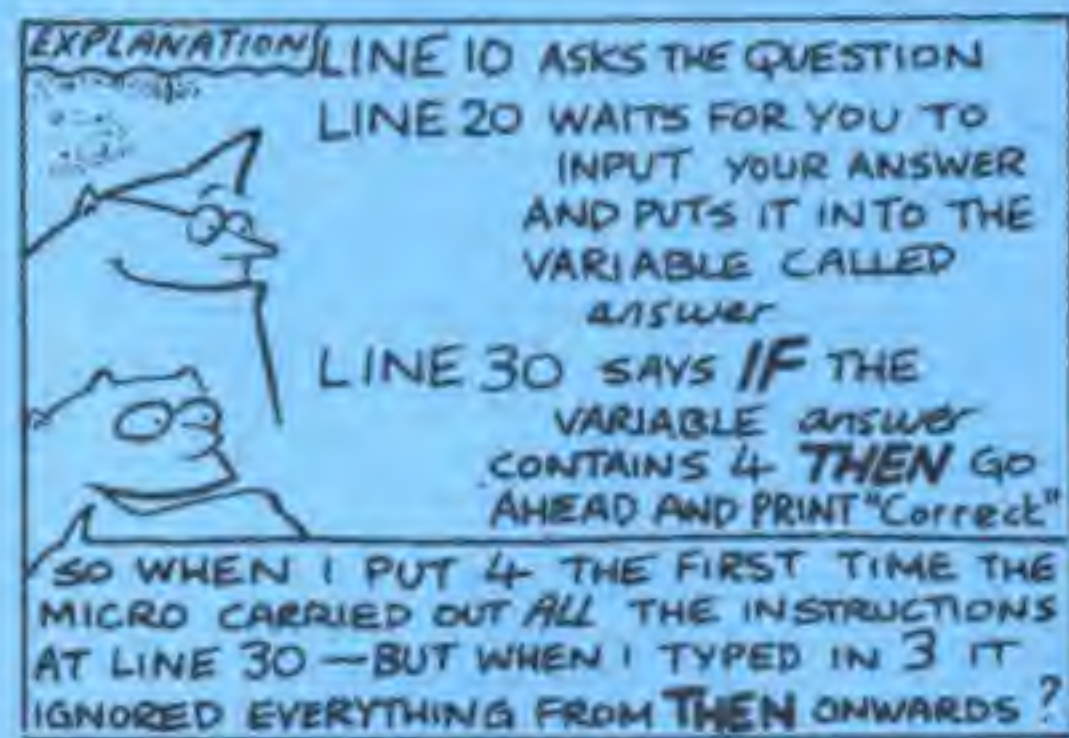
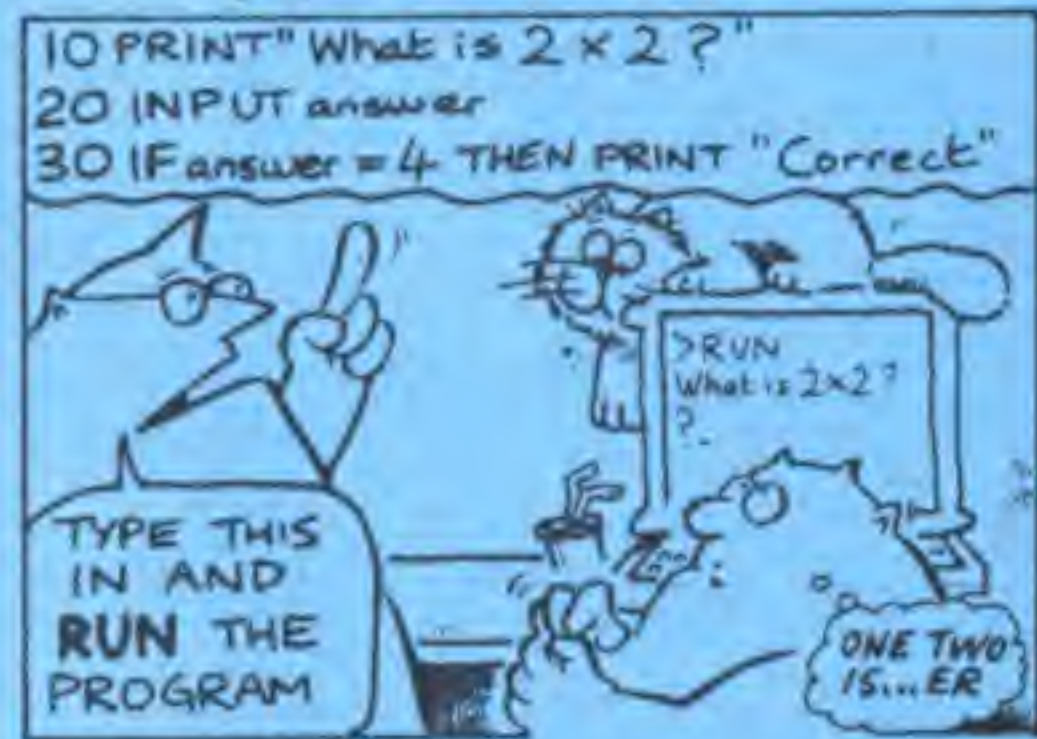
Let's Compute Nov. 90



# BBC BASIC

## WITH

### ROM & RAM







IT IS REALLY HANDY IF YOU WANT TO MOVE SOMETHING ABOUT ON THE SCREEN. THIS PROGRAM WILL SHOW YOU HOW. FIRSTLY, DID YOU KNOW YOU CAN PUT MORE THAN ONE COMMAND ON A LINE? USE A COLON:

```
10 X=4: Y=6
20 A$="ROM": Z=4
30 PRINT X: PRINT A$
```

CHARLIE DRAKE TO CAT: HAVE LOCATED TARGET - MOVER

10 CLS  
20 X=8: Y=8  
30 PRINT TAB(X,Y) "\*" \*  
40 A=INKEY(0)  
50 IF A=88 THEN PRINT TAB(X,Y) " ": X=X+1  
60 IF A=90 THEN PRINT TAB(X,Y) " ": X=X-1  
70 GOTO 30

(RUN THIS PROGRAM AND PRESS KEYS Z AND X TO SEE THE STAR MOVE)

O.K. CHAPS SCRAMBLE!

LINE 40 MAKES THE MICRO WAIT BRIEFLY FOR A KEY PRESS. IF ONE IS PRESSED THE ASCII NUMBER IS PUT INTO VARIABLE A

NOW THEN - LINES 50 AND 60 ARE THE IMPORTANT ONES

IF YOU'VE PRESSED X 88 (THE ASCII NUMBER OF X) IS PLACED INTO A, A SPACE IS PRINTED AT LOCATION X,Y. NEXT THE VALUE OF X IS INCREASED BY ONE.

I'D BETTER READ THAT AGAIN!

INSPIRED

I SEE, AND LINE 60 DOES JUST ABOUT THE SAME - EXCEPT ITS KEY Z (ASCII NUMBER 90) AND VARIABLE X IS DECREASED BY ONE

YES, THIS IS THE BASIS FOR MAKING MOVING MICRO GAMES

FLAP FLAP

LEFT WING DOWN A BIT!

HAVE IT'S NOT FOUL WEATHER

IF THAT FLICKERING CURSOR IS ANNOYING YOU ROM, ADD LINE 5

```
5 VDU23,1,0;0;0;0;0;
```

WHICH WILL REMOVE THE CURSOR

COME IN DUCKS THIS IS CAT HQ - OVER!

VDU23,1,0;0;0;0;0; WILL BRING THE CURSOR BACK

LET'S ADD MOVEMENT UP AND DOWN USING KEYS F AND C

FIRST, LET'S FIND THE ASCII NUMBERS OF F AND C

```
>PRINT ASC("F")
70
>PRINT ASC("C")
67
```

SWIFT EH?

FOR YOU YES!

TAP TAP

NOW ADD LINES 65 AND 66

```
65 IF A=70 THEN PRINT TAB(X,Y) " ": Y=Y-1
66 IF A=67 THEN PRINT TAB(X,Y) " ": Y=Y+1
```

DUCKS TO CAT TARGET IN SIGHT...

TARGET AT 12 O'CLOCK

WE'RE GOING IN! - OVER

CAN I EAT NOW? THIS IS HARD GRAFT RAMBO!

YES, AFTER YOU'VE LEARNED AND AND OR

TYPE NEW. THEN ENTER THIS LISTING:

```
10 CLS
20 A$="BUNS"
30 B$="CRISPS"
40 PRINT "Would you like some " A$
50 PRINT "Press 1 for YES 0 for NO"
60 INPUT choiceA
70 PRINT "Would you like some " B$
80 PRINT "Press 1 for YES, 0 for NO"
90 INPUT choiceB
100 IF choiceA=1 THEN PRINT "Here's your BUNS ROM"
110 IF choiceB=1 THEN PRINT "Here's your CRISPS ROM"
120 IF choiceA=1 AND choiceB=1 THEN PRINT "YOU PIG ROM!"
130 IF choiceA=0 AND choiceB=0 THEN PRINT "Not hungry then!"
```

KRISPY

YOU SHOULD UNDERSTAND UP TO LINE 110 BY NOW. THE ONLY DIFFERENCE AT LINES 120 AND 130 IS THAT TWO CONDITIONS HAVE TO BE MET TO MAKE THE MICRO PRINT SOMETHING...

PREPARE FOR DROP! - OVER

ROGER!

...AT LINE 120 VARIABLE choiceA HAS TO HAVE 1 STORED IN IT AND VARIABLE choiceB HAS TO HAVE 1 STORED IN IT IN ORDER TO CARRY OUT THE INSTRUCTION PRINT "YOU PIG ROM!"

WHO'S ROGER?



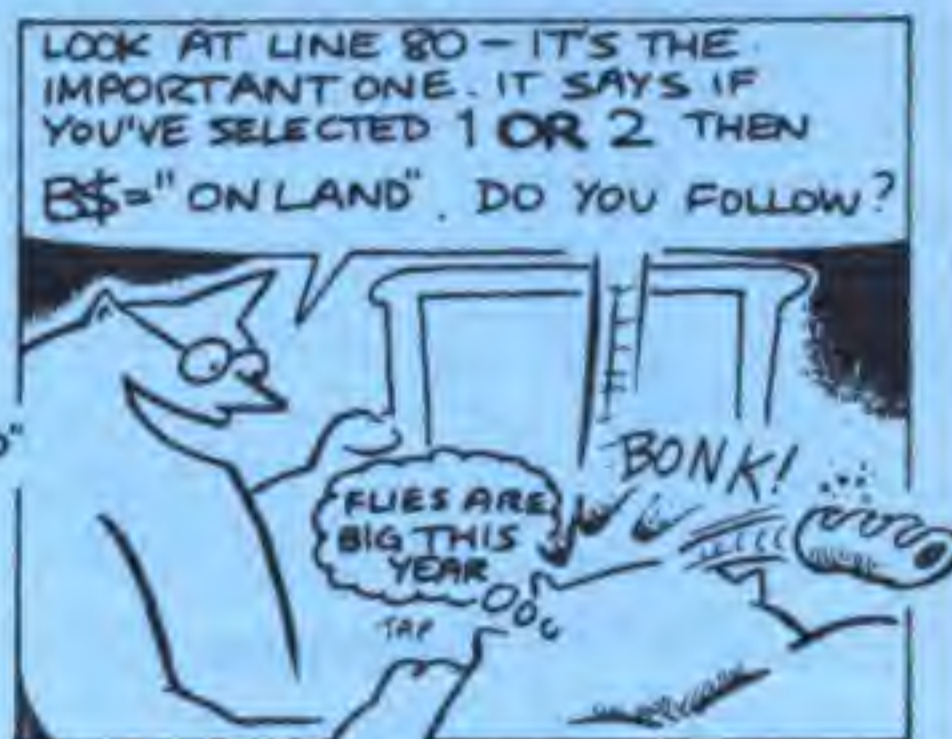


TYPE IN NEW, THEN THIS PROGRAM

```

10 CLS
20 PRINT "1) DOG"
30 PRINT "2) CAT"
40 PRINT "3) FISH"
50 A$ = "THIS ANIMAL LIVES"
60 PRINT "Press a number"
70 INPUT num
80 IF num = 1 OR num = 2 THEN B$ = "ON LAND"
90 IF num = 3 THEN B$ = "IN THE SEA"
100 PRINT A$; B$

```



YES, I WAS GIVEN A CHOICE OF THREE ANIMALS, THEN ASKED TO PICK A NUMBER. THE VARIABLE *num* STORED MY SELECTION AND LINE 80 SEES IF *num* = 1 OR 2. IF I CHOSE 3 LINE 90 MAKES B\$ = "IN THE SEA"

MY WORD!

CAT TO DUCKS RETURN TO BASE! OVER





Gadget shop proprietor  
Mike Cook builds a unique  
electronic game...

# GET SHAKI

One of the hardest things in life is getting the right amount of sauce out of a bottle. The secret is in the shaking. If you do it well you will ALWAYS be able to get the exact amount of sauce you need.

So this month's gadget is a sauce bottle shaking simulator. With it you can play *The Great Sauce Bottle Game*. And you can use it to practice for when you want to shake a real bottle!

It's a novel electronic game. You'll find it great fun as a challenge at a party.

It's also an ideal novelty attraction at a fund-raising event. You can use it to find the best sauce shaker around.

We are going to use a mercury tilt switch like the one shown in the photograph. When it is tilted, a drop of mercury moves over to one end and forms a circuit between two wires.

If the switch is connected to a computer we can find out which way it is tilted. This can have many uses as we shall see later in the Gadget Shop.

*But this month we are going to use one in a rather unique way.*

If you shake the switch the mercury will bounce about from one side to the other. Your computer can work out how long it stayed at the contact end of the tube. And

this forms the basis of our game.

The idea is that if the contact time for a shake is the same as the previous shake you get a point.

You have to win as many points as you can in a given number of shakes.

The wiring is shown below. The parts can be ordered using the coupon on the right.

You will also need the connector from our first visit to the Gadget Shop. If you haven't got one the extra parts can be ordered on the same coupon.

The program printed here controls the game using a BBC Micro. It allows 100 shakes and checks how many times a shake was the same speed as the previous one.

*Listings for other computers are available - see the panel below.*

Rather than just shaking the switch, it's best to either attach it to a cardboard bottle or put it inside a real bottle. It can be fixed to the side with a double-sided sticky pad.

You can alter the program to make it even more fun. How about adding graphics of a sauce bottle with dobs of sauce flying about?

***If you write a good one send it in. If we print it we'll send you a Let's Compute! baseball cap.***



How to connect the mercury switch

The program and computer terms used in this article relate to Acom micros. Readers with an Amstrad CPC, Commodore 64/128, Spectrum, Atari ST or Amiga who order a Gadget Shop pack will be sent complete instructions appropriate to their machines.





# ING!!!

```

10 MODE 7
20 PRINT "The sauce bottle game"
30 PRINT "From the Gadget Shop"
40 PRINT "By Mike Cook"
50 PRINT "Shake at a steady rate to score"
60 SNX=100
70 REPEAT
80 PRINT TAB(0,11);SPC(20)
90 PRINT SPC(24)
100 SLX=0
110 SCOREX=0
120 FOR SNX=0 TO SNX
130 PRINT TAB(0,20);SNX-SN2;" Shakes Let
t";SPC(5)
140 TIME=0
150 REPEAT
160 AX=?&FE60
170 UNTIL (AX AND 1)=0
180 SX=TIME
190 IF SX=SLX THEN SOUND 1,-15,130+SCOREX
200 SLX=SX
210 REPEAT
220 AX=?&FE60
230 UNTIL (AX AND 1)=0
240 NEXT
250 PRINT TAB(0,20);"The bottle is empty"
260 PRINT TAB(0,11);"You scored ";SCOREX
270 PRINT "Press any key to repeat"
280 AS=GET$
290 UNTIL FALSE

```

## IS THIS YOUR COMPUTER?

**BBC Micro:** Use the program above.

**Archimedes and BBC A3000:** You need an i/o module. The program also needs to be changed. Replace Lines 160 and 220 with:

```
SYS "OS Byte",150,860 TO ,,AX
```

Note that the two commas after the TO are essential.

**Electron:** You need a Plus One and User Port expansion - available from Pres (0276 72046). The game and program work as they are described above except that the memory location which is accessed by the User Port is &FCB0. So wherever you see &FE60 in the program you use &FCB0

**Spectrum:** You need an Interface 1 and the gadget connects to the joystick port\*.

**Amstrad CPC, Commodore 64/128, Amiga and ST:** The gadget connects to the joystick port\*.

\* The full assembly instructions are in Gadget Shop Pack 2. The short Basic routine to operate the gadget will be supplied when you order it.

## Warning

Mercury is safe in sealed containers like these switches and thermometers. But it can be dangerous. It is poisonous and even touching it with your bare hands can absorb small amounts into your bloodstream. The mercury in these switches is in a very tough resin casing. It will not accidentally break. But never crush or saw it open.

## Next Month



Christmas is coming. Want to use your computer to find out when your presents arrive? We show you how to build a Father Christmas detector.

## ORDER FORM

### Pack 3 - The Great Sauce Bottle Game

Contains a mercury switch plus pull-up resistor and screw connector. You also need Pack 1 to connect it to your computer.

Show what you want by ticking the correct box below:

☐ Mercury switch + pull up resistor + screw connector .... £2

### You'll also need Pack 1 - the User Port connector cable:

☐ 20 way IDC plug, length of 20 way ribbon cable, 12 way chock block, cardboard base, 2 foam sticky pads PLUS 2 spare connectors and a resistor .... £1.99

☐ As above but with IDC plug ready connected ... £2.49

☐ As above but with connector for Master Compact in place of IDC plug ... £3.99

☐ As above but with connector for joystick port of Spectrum, Amstrad CPC, Commodore 64/128, ST or Amiga in place of IDC plug. Basic program and instructions will also be supplied ... £3.99

Please state your type of computer:

.....  
Educational establishment orders accepted

**Make cheques payable to Musbury Consultants and send to: Musbury Consultants, 8 Fairhill, Helmshore, Rossendale, Lancs BB4 4JX**

Name .....

Address .....

Post code .....





# **Remember the 5th of Nov**



**An old favourite  
gets a new look  
in this unique  
version of Hangman**

As bonfire night approaches, here's a game to get you in the mood.

It's our special version of Hangman. On your screen is a picture of a bonfire. And the words you have to guess all have a firework theme.

Just type in the listing. Then **SAVE** it and **RUN** it.

The dashes that appear on the screen show you the length of the word you have to guess. Press any letter and see what happens.

If it's in the word it will appear in the correct place in the row of dashes.

But if you're wrong? The bonfire will start building up from the bottom of the screen.

Try to guess all the letters in the word before the picture is complete.

The program has been written so that you can easily change it. Look at Lines 550 to 700.

They draw the picture out of letters - just like they are in our Alphabet Artist contest. You can put any picture you want in the program. It must

be 16 lines high and no more than 25 letters long.

If your computer has special features you can use them. For instance, C64 owners could use the graphic characters. BBC Micro owners could design a colourful Mode 7 picture.

If you can define other special characters on your computer you can draw the picture from your own shapes.

As well as putting your own pictures in the game, you can also use your own words. Put them in **DATA** statements like Lines 720 to 740.

You can have as many words as the memory of your computer will allow. Just make sure that you leave the line that says **DATA "EOF"** at the very end of the program.

At the moment it's Line 750. You can give it a higher number if you want.

So type it in, play it, change it and play it again.

**You'll have hours of fun with this one!**





```

10 REM BONFIRE HANGMAN
20 REM (c) Let's Compute!
30 LET X=RND(-TIME)
40 DIM W$(500)
50 LET c=0:LET E$="EOF"
60 LET c=c+1
70 READ W$(c)
80 IF W$(c)<>E$ THEN GOTO 60
90 LET numwr=c-1
100 LET X$=W$(RND(numwr))
110 LET c$=X$
120 LET wr=0
130 LET lgth=LEN(X$)
140 LET g=1
150 LET gap=(20-lgth)/2
160 CLS
170 LET X=26:LET Y=1:GOSUB 500:PRINT "
TRIED"
180 LET X=gap:LET Y=17:GOSUB 500:PRINT
STRING$(lgth,"-")
190 LET ok=0
200 LET X=3:LET Y=19:GOSUB 500:PRINT "
This is move ";g
210 PRINT:PRINT"  PRESS A LETTER";
220 GOSUB 510
230 LET g=g+1
240 FOR c=1 TO lgth
250 IF L$<>MID$(X$,c,1) THEN GOTO 290
260 LET X$=LEFT$(X$,c-1)+" "+MID$(X$,c
+1)

```

```

270 LET X=gap+c-1:LET Y=17:GOSUB 500:P
RINT L$
280 LET ok=-1
290 NEXT c
300 IF ok=0 THEN LET X=28:LET Y=3+2*wr
g:GOSUB 500:PRINT L$
310 IF X$=STRING$(lgth," ") THEN GOTO3
40
320 IF ok=-1 THEN GOTO 190
330 LET wr=wr+1:GOTO 370
340 CLS
350 LET X=5:LET Y=17:GOSUB 500:PRINT "
WELL DONE"
360 GOTO 450
370 LET X=0:LET Y=16-2*wr:GOSUB 500
380 IF wr=8 THEN GOTO 410
390 ON wr GOSUB 690,670,650,630,610,5
90,570
400 GOTO 190
410 GOSUB 550
420 LET X=1:LET Y=17:GOSUB 500:PRINT "
HARD LUCK "
430 PRINT:PRINT"  THE WORD WAS "
440 PRINT SPC((18-LEN(c$))/2)c$;SPC((1
8-LEN(c$))/2)
450 PRINT "  ANOTHER GO? ";
460 GOSUB 510
470 IF L$="Y" THEN GOTO 100
480 IF L$<>"N" THEN GOTO 460
490 CLS:END

```

```

500 PRINTTAB(X,Y);:RETURN
510 LET L$=GET$
520 IF L$>"Z" THEN LET L$=CHR$(ASC(L$)
-32)
530 RETURN
540 REM Picture by Colin Steele
550 PRINT "  0"
560 PRINT " /@_ *"
570 PRINT " * I"
580 PRINT " L *"
590 PRINT " ***"
600 PRINT "**** *"
610 PRINT " # # *"
620 PRINT "***** *"
630 PRINT "### # ** *"
640 PRINT " # # # *      00"
650 PRINT "#### ***      <>"
660 PRINT " # ***** **      <<####"
670 PRINT "### ### # * *      < ####"
680 PRINT " # ### # # **      ####"
690 PRINT "##### # # * *      11"
700 PRINT " # ### # # **      11"
710 RETURN
720 DATA "BONFIRE","FIREWORK","SPARKLER
","TREACLE","APPLES","ROCKET"
730 DATA "CHESTNUT","GUY","GUNPOWDER",
"LOT","CANDLE","MATCHES"
740 DATA "BANGERS","FUN","DISPLAY"
750 DATA "EOF"

```

## IS THIS IS YOUR COMPUTER?

### BBC Micro/Electron/Archimedes

The listing works as shown

### Amstrad CPC

Change the following lines:

```

30 RANDOMIZE TIME
100 LET X$=W$(INT(RND*numwr+1))
500 LOCATE X+1,Y+1: RETURN
510 LET L$="":WHILE L$="":LET L$=INKEY
$:WEND

```

### ST(Stos)/Amiga(AMOS)

Change the following lines:

```

30 KEY OFF : MODE 0 : LET x=RND(TIMER
)
100 LET X$=W$(RND(numwr-1)+1)
440 PRINT SPACES((18-LEN(c$))/2)c$;SPA
CES((18-LEN(c$))/2)
500 LOCATE x,y:RETURN
510 LET L$=INPUT$(1)

```

Amiga: Use CLS instead of MODE 0

### C64/128

Enter the program in capitals.  
Change or add the following lines:

```

25 FOR N=1 TO 20:DASH$=DASH$+"-":SKIP
$:SKIP$+" ":NEXT
100 LET X$=W$(INT(RND(0)*NUMWRD+1))
160 PRINT CHR$(147)
180 PRINT LEFT$(DASH$,LGTH)
310 PRINT LEFT$(SKIP$,LGTH)
340 PRINT CHR$(147)
440 PRINT LEFT$(SKIP$, (18-LEN(c$))/2);
c$;LEFT$(SKIP$, (18-LEN(c$))/2)
490 PRINT CHR$(147):END
500 POKE 211,X:POKE214,Y:SYS58732:RETU
RN
510 GET L$:IF L$="" THEN GOTO 510

```

### PC (GW-Basic)

Change the following lines:

```

30 RANDOMIZE TIMER
100 LET X$=W$(INT(RND*numwr+1))
500 LOCATE X+1,Y+1: RETURN
510 LET L$="":WHILE L$="":LET L$=INKEY
$:WEND

```

### Spectrum

Use 48k mode.  
Change or add the following lines:

```

30 RANDOMIZE
40 DIM W$(500,16): DIM M(500): DIM E
$(16): DIM S$(16)
45 LET S$=" ":LET B$="-----"
-
70 READ X$: LET W$(c)=X$: LET M(c)=LE
N (X$)
100 LET c= INT (RND*numwr+1): LET X$=
W$(c)
130 LET lgth=M(c)
180 LET X=gap:LET Y=17:GOSUB 500:PRINT
B$(1 TO lgth)
250 IF L$<>X$(c) THEN GOTO 290
260 LET X$=X$(1 TO c-1)+" "+X$(c+1 TO
)
310 IF X$=S$ THEN GOTO340
390 LET LINE=710-20*wr: GO SUB LINE
440 PRINT S$(1 to (18-lgth)/2);c$
490 CLS:STOP
500 PRINT AT Y,X;:RETURN
510 LET L$=INKEY$: IF L$="" THEN GOTO
510
520 IF L$>"Z" THEN LET L$=CHR$(CODE(L$
)-32)

```





# ALL MIXED UP!

***Save money with  
the Safe Scientist  
– as he shows a  
no-waste way of  
mixing chemicals***

This month we're up to our armpits in acids and alkalis. As a scientist would say, we're working on neutralisation.

Your task? To find out just how much alkali will react perfectly with a quantity of acid.

But because you're using a computer and not real chemicals, you won't be pouring any down the plughole. Which could be quite a saving!

Start by keying in the program. When you've done that, **SAVE** it and **RUN** it.

After a title page, you will be asked how much acid you want to use. You can also choose the strength of acid and alkali.

Now the experimenting starts.

The acid is shown in a beaker. It's coloured red because it has a litmus indicator in it. You slowly add alkali from a device called a burette. This process is called titration.

The alkali reacts with the acid to produce a salt. When the right amount of alkali has been added the mixture will turn purple.

At this point stop adding alkali. If you continue the liquid will turn blue. This means you have ruined it.

The idea is to find a rule so that you can always work out how much alkali you will need. Then, perform the experiment to see if you're right.

If you can see the patterns in processes like this you are well on the way to becoming a good scientist.

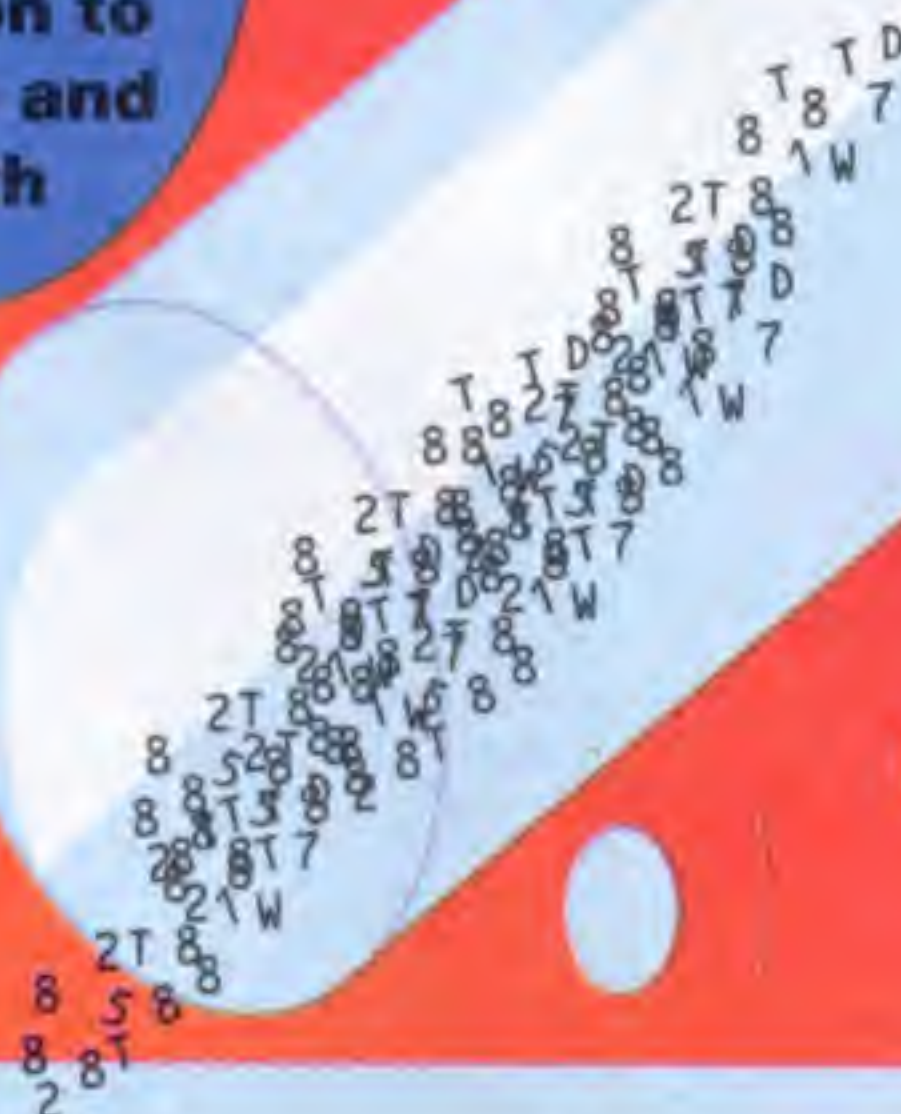
**For the  
Electron,  
Archimedes,  
and BBC  
only**



## NATIONAL CURRICULUM AREAS COVERED

This program helps  
with section seven -  
**Making New Materials.**  
Also, because it is in  
the form of an  
investigation, it is an  
**Exploration of Science.**  
This is the first  
attainment target.

## NEXT MONTH The Safe Scientist turns his attention to science and health



```
10 MODE6
20 *FX11,0
30 PROCsetup
40 REPEAT
50 MODE6
60 VDU23;8202;0;0;0;0;
70 PROCvar
80 MODE2
90 PROCdraw
100 PROCdotheexpt
110 MODE6
120 PROCTable
130 UNTIL0
140 END
150 DEFPROCsetup
155 *FX15
160 PRINTTAB(4,1)"ACIDS, ALKALIS AND I
NDICATORS"TAB(4,2)"-----"
170 VDU23,224,0,0,24,60,60,24,0,0
180 qacidX=30:sacidX=1:salkaliX=2
190 PRINTTAB(4,22)"Press Space to cont
inue"
200 REPEATUNTILINKEY=99
210 ENDPROC
220 DEFPROCdraw
230 VDU23;8202;0;0;0;0;
240 MOVE200,600:DRAW200,1000
250 MOVE260,600:DRAW260,1000
260 MOVE200,600:DRAW220,580
270 MOVE260,600:DRAW240,580
280 MOVE220,580:DRAW220,500
290 MOVE240,580:DRAW240,500
300 MOVE140,300:DRAW140,100:DRAW340,10
0:DRAW340,300
310 VDU5:FORN=600T0950STEP50:MOVE50,N
X+16:PRINT;(NXMOD600)/5
320 MOVE190,NX:DRAW200,NX:NEXT:VDU4
330 VDU5:FORN=9T012:VDU19,NX,0;0;:GCO
L0,NX
340 MOVE205,340+(NX-9)*40:PRINTCHR$224
:NEXT:VDU4
350 VDU19,8,1;0;
360 GCOL0,8
370 FORNX=104T0104+qacidX*2 STEP4:PLOT
```

```
77,144,NX:NEXT
380 GCOL0,13:VDU19,13,7;0;:MOVE228,540
:DRAW232,540
390 GCOL0,7
400 MOVE200,950:DRAW260,950
410 LX=qacidX*2+104:HX=950
420 ENDPROC
430 DEFPROCdotheexpt
440 VDU28,8,26,19,2:COLOUR132:CLS:COLO
UR3
450 PRINT""Press Space""to add""a
lkali""""Press""Return to""end the
""experiment"
460 REPEAT
470 IF INKEY=99 PROCdrop
480 UNTILHX=600 OR INKEY(0)=13
490 ENDPROC
500 DEFPROCdrop
510 VDU19,13,0;0;
520 FORNX=12T09 STEP-1
530 VDU19,NX,6;0;
540 VDU19,NX,0;0;
550 NEXT
560 VDU19,13,7;0;
570 GCOL0,8:PLOT77,144,LX:LX=LX+1
580 GCOL0,0:MOVE208,HX:DRAW252,HX:HX=H
X-5
590 GCOL0,7:MOVE208,HX:DRAW252,HX
600 qalkX=(950-HX)/DIV5
610 IF qalkX*salkaliX=qacidX*sacidX VD
U19,8,5;0;:result$="You have neutralised
the acid and alkali"
620 IF qalkX*salkaliX>qacidX*sacidX VD
U19,8,4;0;:result$="You have added too m
uch alkali."
630 ENDPROC
640 DEFPROCvar
650 PRINTTAB(6,2)"SET THE VARIABLES"TA
B(6,3)"-----"
660 PRINTTAB(2,6)"How much acid?"TAB(2
,8)"Strength of acid?"TAB(2,10)"Strength
of alkali?"
670 PRINTTAB(24,6);qacidX;TAB(24,8);sa
cidX;TAB(24,10);salkaliX
680 NX=6
```

```
690 REPEAT
700 *FX15,0
710 PRINTTAB(24,NX);SPC(2)
720 PRINTTAB(4,16)"Press Space to sele
ct variable"
730 PRINTTAB(4,19)"Use < and > to chan
ge values"
740 PRINTTAB(4,22)"Press Return to con
tinue"
750 IF INKEY=99 NX=NX+2
760 IF NX>10 NX=6
770 IF NX=6 AND qacidX<30 AND INKEY=10
4 qacidX=qacidX+1
780 IF NX=6 AND qacidX>5 AND INKEY=103
qacidX=qacidX-1
790 IF NX=8 AND sacidX<3 AND INKEY=104
sacidX=sacidX+1
800 IF NX=8 AND sacidX>1 AND INKEY=103
sacidX=sacidX-1
810 IF NX=10 AND salkaliX<3 AND INKEY=
104 salkaliX=salkaliX+1
820 IF NX=10 AND salkaliX>1 AND INKEY=
103 salkaliX=salkaliX-1
830 PRINTTAB(24,6);qacidX;TAB(24,8);sa
cidX;TAB(24,10);salkaliX
840 TIME=0:REPEATUNTILTIME>20
850 UNTILINKEY(0)=13
860 result$="You have not added enough
alkali.":qalkX=0
870 ENDPROC
880 DEFPROCTable
890 PRINTTAB(6,2)"ACIDS, ALKALIS AND I
NDICATORS"TAB(6,3)"-----"
900 PRINT""Quantity of acid = ";qacid
X
910 PRINT""Strength of acid = ";sacid
X
920 PRINT""Quantity of alkali=";qalkX
930 PRINT""Strength of alkali=";salka
liX
940 PRINT"result$
950 PRINTTAB(4,22)"Press Return to con
tinue":REPEATUNTILINKEY(0)=13
960 ENDPROC
```



# It's

# C

# P

# U

# time



Last month we looked at several input devices. They all have one thing in common: They work by sending pulses of electricity to the CPU (Central Processor Unit).

But how does the CPU itself do its magic?

There are two main parts to a CPU: The Control unit and the Arithmetic unit. The panel below helps to explain what they do.

The easiest way to understand how the two parts work together is to think of them as a man using a calculator. The man is the Control unit. The calculator is the Arithmetic unit.

Suppose that – just like the CPU –

the man has to carry out some instructions for you. The panel shows both he and a CPU would do the simple sum  $4 + 5$ .

You may be wondering how a computer does things with letters. We've already seen that everything in a computer is coded and represented by numbers.

Remember, the letter A is represented by 65. So the Control unit changes the A into the number 65. It can now be dealt with by the Arithmetic unit.

And once the Control unit has finished with the numbers they can be passed to an output device. *We'll look at those next month.*

MAN	CPU
Read first instruction (add).	Read first instruction.
Understand first instruction.	Decode first instruction.
Shout for help if it's not understood.	Report error.
Gather together any information needed to carry out instruction (the numbers to add – 4 and 5). Then key them into the calculator.	The Control unit passes the instruction and numbers to the Arithmetic unit.
Press the = button on the calculator.	The Control unit tells the Arithmetic Unit to work it out.
The answer is displayed on the calculator for the man to see.	The Arithmetic unit tells the Control unit it has finished it has finished.
The man writes the answer down for you to read when you're ready.	The Control unit tells the Arithmetic unit to send the answer to the computer's memory.
You read the answer.	The answer used in another part of the program or sent to an output device.

*We'll be looking at these next month*



# HOW A COMPUTER WORKS

## BINARY BITS

Counting to seven in binary numbers is easy. Remember last month we said it was similar to counting in weeks, fortnights and months.

Seven weeks can be written as:

1 month + 1 fortnight + 1 week

So, in binary, we would write the decimal number seven as 111.

That's 1 Four + 1 Two + 1 Unit. But how do we write eight in binary?

We can't have 112 because, in binary, we can only use ones and zeros. It's similar to when we reach 99 in the decimal system - we can't go up to ninety-ten.

In that case Hundreds come to the rescue and we go 99, 100.

In our binary example we bring in the Eights. So after seven - 111 - we get 1000.

Now with our Eights, Fours, Twos and Units we can count up to 15.

For example, 13 becomes 1 Eight + 1 Four + 0 Twos + 1 Unit - 1101. On the right we show all the binary numbers up to 15.

Can you think how the decimal number 16 will be written in binary? We'll give you the answer next month. And we'll see why it's more easy to add numbers in binary than in

Decimal (Hundreds, Tens and Units)			Binary (Eights, Fours, Twos and Units)			
H	T	U	E	F	T	U
		0				0
		1				1
		2			1	0
		3			1	1
		4		1	0	0
		5		1	0	1
		6		1	1	0
		7		1	1	1
		8	1	0	0	0
		9	1	0	0	1
	1	0	1	0	1	0
	1	1	1	0	1	1
	1	2	1	1	0	0
	1	3	1	1	0	1
	1	4	1	1	1	0
	1	5	1	1	1	1

**NEXT MONTH: We look at how facts and figures are OUTPUT from the computer!**

## ANSWER BACK Junior Quiz



(for ages 6-11)

If you like quizzes this program is for you! There are 750 general knowledge questions for you to try. Each time you find the right answer you can have another turn in the game. Can you defeat the dreadful dragon and save the owner of the Castle?

The program even lets you write your own quizzes and save them on disc or cassette - amaze your friends!

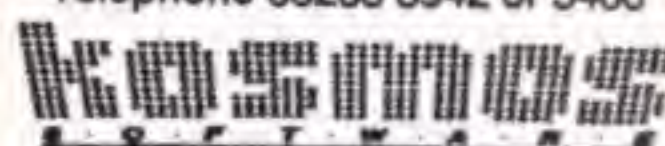
BBC/Electron/Amstrad case £9.95 Spectrum cassette £8.95  
BBC disc (40 or 80 track) £10.95 BBC 3.5" disc £12.95  
Amstrad CPC 3" disc £13.95 Spectrum +3 disc £10.95  
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## Mijas Software

The New Issue of  
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Meekings  
£11 inclusive.

### Small C System £69 (Inclusive of VAT p&p)

Use the Mijas Small C System on the BBC B or MASTER series computers for games, educational and industrial software. Small C programs run up to 12 times faster than in BASIC. Your code is highly portable and can be recompiled to run on the ARCHIMEDES or R140 using the Acorn ANSI C compiler (not supplied) and on many other machines. You can also use the power of the ARCHIMEDES for the rapid development and test of BBC B or MASTER programs. Manuals and post sales support included.

This Small C System produces stand-alone programs with up to 40K of code in ROM and/or MAIN memory. Libraries, extendable by the user, provide memory allocation, multi-mode graphics, file handling, I/O formatting, string handling, and system calls. Full assembler interface.

The system includes the V3.0 Small C compiler & Libraries\*, Optimiser, Assembler, Linker, Source-Level Debug, and SHELL. SOURCE CODE is supplied for the compiler and all libraries. Using the MAKE facility and editable makefiles, C code is automatically compiled to assembler source, assembled and then linked with the minimum necessary library code.

Available for the MASTER series Computers, BBC B+ or B with sideways ram, and ARCHIMEDES. Software supplied on 80T double sided 5.25" or 3.5" ADFS or DFS disk. The ADFS disk contains the SHELL source code. The system is also available for other hardware configurations, including systems for the Mitsubishi MELPS processors, please write for details.

### Laser Typesetting Program £23 inclusive

Low cost DTP for any BBC B, MASTER or ARCHIMEDES. Requires an HP Deskjet or Laserjet printer or emulation. Use for letters, booklets, forms and manuals with rules and shading, full multi-font justification, in single or multi-column. Fast printing using the printer's internal fonts. ADFS or DFS disk with rom image, £23 inclusive of vat, p&p. Eprom (avoids the need for sideways ram on BBC B) £7 extra.

Please state your computer system when ordering from:-  
MIJAS SOFTWARE, Winchester Rd. Micheldever,  
Winchester, Hants SO21 3DG. Tel 0962 89 352.  
Official orders, ACCESS and VISA Welcome

\*Includes original Small C code supplied at the cost of distribution.



A black and white cartoon illustration of a man with a large head and a wide smile, riding a bicycle. He is wearing a t-shirt and shorts. The bicycle is in motion, with motion lines around the wheels and the character. In the background, there is a church with a steeple and some trees. A large speech bubble from the character contains the text 'DON'T MISS AN ISSUE!'. Another speech bubble coming from the bicycle contains the text 'LET'S COMPUTE!'. A third speech bubble, which is the largest, contains the text 'ASK YOUR NEWSAGENT TO DELIVER YOUR COPY EVERY MONTH!'.

DON'T MISS  
AN ISSUE!

LET'S  
COMPUTE!

ASK YOUR  
NEWSAGENT TO  
DELIVER  
YOUR COPY  
EVERY MONTH!

Dear Mr Newsagent

Please deliver *Let's Compute!* to the  
address below until further notice.

Name \_\_\_\_\_

Address \_\_\_\_\_  
\_\_\_\_\_

*Note to newsagent: If you have difficulty in obtaining  
Let's Compute! please contact the distributors to the  
news trade, COMAG, on 0895 444 055.*



# A QUICK PHONE CALL NOW COULD WIN YOU . . .

Household names Grundig, Hitachi, Sky and Pace combined to bring you the prize of the year – a complete stereo satellite TV system, with EVERYTHING else you need to bring you all-round TV enjoyment! Every item is right up-to-the-minute. Here is the very last word in TV technology . . . all at the touch of a button.

To win the ENTIRE collection all you have to do is make a phone call and answer six simple questions. We've even presented you with a choice of answers! Then give your name and address...and the first correct answer pulled from our electronic sack will be the winner.

One item alone is worth £380 – the new Pace Receiver/Decoder & Dish. It's been hailed as the very last word in satellite technology.

Pace is Europe's largest manufacturer of satellite TV receivers and their SS9000 IRD has just about everything you might need – including a built-in videocrypt decoder for scrambled channels such as Sky Movies. It's all ready to receive the 16 extra channels of the new Astra-1b satellite – giving you 60 channels in all. It even incorporates a VCR timer that lets you pre-select different channels so that they can be recorded unattended! Remote control on-screen graphics make it simplicity to use. The 60cm dish that comes with your prize is made of a stylish black mesh which blends well with any surrounding.



**..the very latest stereo  
satellite TV system –  
and ALL of these  
valuable additions**

## These are the questions:

- Who invented the very first TV set?  
a) Bell in 1900      b) Baird in 1926      c) Einstein in 1929
- When did commercial TV start in Great Britain?  
a) 1955      b) 1969      c) 1970
- Which was the first Royal coronation to be screened on TV?  
a) Elizabeth II      b) George VI      c) Edward VIII
- Who wrote the theme tune to the award winning film, Chariots of Fire?  
a) Phil Collins      b) Mike Oldfield      c) Vangelis
- Which star of Wall Street is a famous son of a famous actor?  
a) Jason Connery      b) Kiefer Sutherland      c) Michael Douglas
- Mork appeared in Good Morning Vietnam. Who is he better known as?  
a) John Belushi      b) Robin Williams      c) Tom Conti

## PLUS Watch a year of Sky Movies!

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WORTH £120

Here's a whole year's subscription to the Sky Movie Channel. Would you turn down a date with your favourite Hollywood star in your own home? With prestigious films such as Dangerous Liaisons, Tequila Sunrise and The Dead Pool already under their belt – future features and releases are very exciting and far too good to miss.



## PLUS Latest stereo TV receiver

Grundig ST55-450  
WORTH £530

With stereo sound, the popular 21in flat square tube PLUS remote control and teletext combine with Grundig's exceptional CTI for increased colour contour sharpness, electronically eliminating colour overlap to give you a much crisper picture. The sound quality is excellent with 2x8 watts of music power, two lateral wideband speakers and two frontal tweeters. Add to this a stereo base expansion and switchable sound channels and you have the very best in 1991 TV technology.



## PLUS Latest stereo video recorder

Hitachi VT-M740  
WORTH £380

The new sleek design of this two-speed front-loading remote control VCR with four video heads hides a range of features including a title making facility and audio dubbing. You can also have clean still and variable slow motion PLUS digital auto-tracking enhancing the quality of sound and picture by automatically keeping the heads and tracks aligned. Other new features are the on-screen display facility and demonstration and a child lock – proof against little fingers. This really IS state-of-the-art in video recording.



**To enter, simply phone: 0898 333 543**

Ensure you have the owner of the phone's consent before making this call

Calls cost 33p per minute cheap; 44p per minute at all other times.

Contest ends December 31 1990

Database Publications/Legion



# CRACK THE CODE

*Have you ever wanted to send someone a secret message? Alan McLachlan has just the program for you. It will mix up your words so that only people who know the code can read them.*



Secret agents use a computer program to send top secret messages to each other. Now *Let's Compute!* readers can do the same.

Using our program, your messages are turned into coded text. The way they are coded depends on a secret number that YOU decide.

Without knowing the secret number it is very difficult for anyone else to read your message. Don't forget it. And only let authorised people know it!

But a program that codes messages is no use unless you have a program to decode them as well. So this program does both.

Type it in, SAVE it and RUN it. The first question you'll be asked is whether you want to code or decode a message. Answer C or D.

Then you'll be asked for your secret code number. This can't be any old number. The panel opposite tell you how to make one up.

If the number you enter is not valid the

computer will inform you. It will also give you some suitable suggestions. And make sure you remember the number - you won't be able to decode your message without it!

Next, just type in your message. It can be up to 255 letters long on most computers (80 on a C64). After you press Return there will be a slight pause and then you will see your words converted into secret code!

Here's what a coded message looks like:

`iw$XLvxiigkri$e(vex$exu$piri$uxJ$$enpi}`

Can you crack it? Any coding system can be broken. But you'll discover that the *Let's Compute!* code is very tricky to break.

If you do discover what the message says, let us know. We'll send a baseball cap to the person who sends us the first correct translation!



## THINK OF A NUMBER

The way a message is encoded depends on your secret number. When you make one up there are three rules you must follow:

- It must be six figures long.
- The first five figures must be all the numbers 1 to 5, but they can be in any order.
- The last figure has to be a number between 0 and 4.

Here are some examples of numbers you can use:

132542543210  
543212

## HOW THE COMPUTER CODES THE MESSAGE

The computer takes your message and mixes it up. The way it does this depends on the secret number you typed in.

Here's how the message *Hi there Pete* is coded using the number 23154

- The message is split into groups of five letters. So our message splits like this:

Hi th ere P ete

Note that the space counts as a letter. The number of letters in the last group will sometimes be less than five. That is what has happened here.

- Next, the groups of letters are mixed up. The first five numbers of the secret number are used to decide the new order.

So, using the pattern 23152, The first group – *Hi th* – becomes *i Hht*.

The last group is not mixed up unless it is exactly five characters long.

- The letters are then all changed to letters higher up the alphabet. The last letter of your secret code lets the computer know how much to shift them.

The last number of our example code is 2. So A becomes C, B becomes D and so on. Space and letters at the end of the alphabet become characters such as brackets and commas.

With the shift of two places, our message (*i Hht*) is changed to *k"Jjv*.

Here's how the word *COMPUTER* is coded using several secret numbers:

Code number	Coded word
123450	COMPUTER
123451	DPNQVUFS
543210	UPMOCTER
543212	WROQEVGT

Now for an example you can try for yourself. Use the code 341253 and key this in:

There's a message on your answering machine

The result – in code – is:

huWkh#d\*v#vvphd#rjhqrx#juqv#dzlqhujdf#pkqlh

```

10 REM Crack the code!
20 REM (c) Let's Compute!
30 CLS
40 DIM P(6)
50 PRINT "The Let's Compute! Secret C
oder"
60 PRINT:PRINT:PRINT
70 GOSUB 200
80 PRINT:PRINT
90 PRINT "Code or Decode (C/D)":GOSUB
670
100 IF AS="C" OR AS="c" THEN GOSUB 410
:GOTO 130
110 IF AS="D" OR AS="d" THEN GOSUB 490
:GOTO 130
120 GOTO 90
130 PRINT:PRINT "Do you want to use th
e program again?":GOSUB 670
140 IF AS="N" OR AS="n" THEN CLS:END
150 IF AS<>"Y" AND AS<>"y" THEN GOTO 1
30
160 CLS:PRINT "Do you want to use the
same code number?":GOSUB 670
170 IF AS="Y" OR AS="y" THEN GOTO 80
180 IF AS="N" OR AS="n" THEN GOTO 70
190 GOTO 160
200 REM SPECIAL NUMBER
210 INPUT "What is your code number";N
$
220 IF LEN (NS)<>6 THEN LET FLAG=1:GOTO
280
230 LET FLAG=0:LET MS=LEFT$(NS,5)
240 FOR I = 49 TO 53
250 IF INSTR(NS,CHR$(I))=0 THEN LET FL
AG=1
260 NEXT I
270 IF RIGHT$(NS,1)<"0" OR RIGHT$(NS,1
)>"4" THEN GOSUB 310:GOTO 210
280 IF FLAG=1 THEN GOSUB 310:GOTO 210
290 RETURN
300 REM WRONG NUMBER
310 CLS:PRINT "Code number wrong (see
Let's Compute!)":PRINT
320 RETURN
330 REM MESSAGE
340 CLS:PRINT "Type in your message"
350 LET MS="":LET L=0
360 GOSUB 670:IF AS=CHR$(13) THEN GOTO
390

```

```

370 LET MS=MS+AS:LET L=L+1:IF AS=CHR$(
127) AND L>1 THEN LET L=L-2:LET MS=LEFT$
(NS,L)
380 LET X=0:LET Y=4:GOSUB 700:PRINT MS
;"":GOTO 360
390 IF MS="" THEN GOTO 340
400 RETURN
410 REM CODE
420 FOR I=1 TO 6:LET P(I)=VAL(MID$(NS,
I,1)):NEXT I
430 GOSUB 330:LET MS=LEFT$(MS,L)
440 CLS:PRINT "Your message is being c
oded"
450 LET SS=MS:GOSUB 570:LET CS=RS
460 CLS:PRINT "Your message:";PRINT:PR
INT MS
470 PRINT:PRINT"has been coded to:":PR
INT:PRINT CS
480 RETURN
490 REM DECODE
500 FOR I=1 TO 5:LET P(VAL(MID$(NS,I,1
)))=I:NEXT I:LET P(6)=-VAL(MID$(NS,6,1))
510 GOSUB 330:LET CS=LEFT$(MS,L)
520 CLS:PRINT "Your message is being
decoded."
530 LET SS=CS:GOSUB 570:LET MS=RS
540 CLS:PRINT "Your coded message:":PR
INT:PRINT CS
550 PRINT:PRINT"has been decoded to:":
PRINT:PRINT MS
560 RETURN
570 REM DO CODE/DECODE
580 LET RS="":IF L<5 THEN GOTO 640
590 FOR I = 0 TO INT((L-5)/5)
600 FOR J=1 TO 5
610 LET RS=RS+CHR$(ASC(MID$(SS,I*5+P(J
),1))+P(6))
620 NEXT J
630 NEXT I
640 LET I=5*INT(L/5)
650 IF I<L THEN LET I=I+1:LET RS=RS+CH
R$(ASC(MID$(SS,I,1))+P(6)):GOTO 650
660 RETURN
670 REM GET
680 AS=GET$
690 RETURN
700 REM TAB(X,Y)
710 PRINT TAB(X,Y);:RETURN

```

## IS THIS YOUR COMPUTER?

### Electron/BBC/Archimedes

The programs work as shown

### Amiga and Atari ST

Remove line 370

Change the following lines:

```

10 MODE 0:KEYOFF:HIDE
680 AS=INPUT$(1)
710 LOCATE X,Y:RETURN

```

NOTE Delete won't work as you type your message in, so take care.

Amiga use CLS instead of MODE 0

### Commodore 64/128

Enter the program in capitals.

Replace every CLS with PRINT CHR\$(147);

Change or add the following lines:

```

250 LET F=0:FOR J=1 TO 5:IF MID$(NS,J
,1)=CHR$(I) THEN LET F=1
255 NEXT J:IF F=0 THEN LET FLAG=1
370 LET MS=MS+AS:LET L=L+1
375 IF AS=CHR$(20) AND L>1 THEN LET L=
L-2:LET MS=LEFT$(MS,L)
680 GET AS:IF AS="" THEN GOTO 680
710 POKE 211,X:POKE 214,Y:SYS58732:RET
URN

```

### Spectrum

Select 48k mode

Change or add the following lines:

```

140 IF AS="N" OR AS="n" THEN CLS:STOP
230 LET FLAG=0:LET MS=NS ( TO 5)
250 LET FOUND=0:FOR J=1 TO 5:IF MS(J)
=CHR$(I) THEN LET FOUND=1
255 NEXT J:IF FOUND=0 THEN LET FLAG=1
270 IF MS(6)<"0" OR MS(6)>"4" THEN LET
FLAG=1
370 LET MS=MS+AS:LET L=L+1:IF AS=CHR
$(127) AND L>1 THEN LET L=L-2:LET MS=MS T
O L)
420 FOR I=1 TO 6:LET P(I)=VAL(MID$(NS,I)):
NEXT I
430 GOSUB 330:LET MS=MS ( TO L)
500 FOR I=1 TO 5:LET P(VAL (MS(I)))=I:
NEXT I:LET P(6)=-VAL (MS(6))
510 GOSUB 330:LET CS=MS ( TO L)
610 LET RS=RS+CHR$(CODE (SS(I*5+P(J))
)+P(6))
650 IF I<L THEN LET I=I+1:LET RS=RS+CH
R$(CODE (SS(I))+P(6)):GO TO 650
675 IF INKEY$<>" " THEN GO TO 675
680 LET AS=INKEY$:IF AS="" THEN GO TO
680
710 PRINT AT I,X;:RETURN

```

### Amstrad CPC/PC (GW-Basic)

Change the following lines:

```

680 LET AS="":WHILE AS="":LET AS=INKEY
$:WEND
710 LOCATE X+1,Y+1:RETURN

```





# SHOO

***Discover how easy it is to make your computer move things round the screen. Then type in and play this fast-action game***

## **CONTROLLING YOUR SPEED**

Line 10 lets you decide how fast you want the objects to move. You can start with a slow game and make it faster as you get better.

Increase the number in **D=10** to slow the game down.

Have you ever wondered how the objects are moved around the screen in games? The answer is that they never move at all!

Put simply, they are wiped out from one position then redrawn nearby. It happens so fast that your eye is tricked into thinking they're moving.

How realistic the movement is depends on two things: How far the object is shifted. And how quickly it can be drawn.

Imagine you want to move a star - \* - around the screen. Start by printing it.

Next you print a space right over. Then you reprint the star nearby. That's all that Lines 50 and 60 in the program do.

The effect is a falling star. We can make a game from this simple start. Let's add an arrow which can from right to left.

Line 130 draws an arrow, together with the space that wipes out the one already there. It starts moving when you press the spacebar.

So, with just a few lines of program, we've got a game. The object is to hit the star with the arrow.

**Type the listing in, SAVE it and RUN it. See if you can hit ALL the stars that fall!**



# TING STARS



```

10 LET D=10
20 CLS
30 LET X=31:LET Y=10:GOSUB 220:PRIN
T"<"
40 LET I=1
50 LET X=3:LET Y=I-1:GOSUB 220:PRIN
T" "
60 LET X=3:LET Y=I:GOSUB 220:PRINT"
*"
70 FOR J=1 TO D:NEXT J
80 LET I=I+1
90 GOSUB 240
100 IF I<20 AND K$<>" " THEN GOTO 50
110 IF I=20 THEN LET X=6:LET Y=21:GO
SUB 220:PRINT "TOO SLOW":GOTO 180
120 FOR K=30 TO 3 STEP -1
130 LET X=K:LET Y=10:GOSUB 220:PRINT
"<"
140 FOR J=1 TO D:NEXT J
150 NEXT K
160 IF I=11 THEN LET X=6:LET Y=21:GO
SUB 220:PRINT "WELL DONE"
170 IF I<>11 THEN LET X=5:LET Y=21:GO
SUB 220:PRINT "YOU MISSED"
180 LET X=5:LET Y=22:GOSUB 220:PRINT
"ANOTHER GO?"
190 GOSUB 240
200 IF K$="Y" THEN RUN
210 IF K$<>"N" THEN GOTO 190
220 PRINTTAB(X,Y);
230 RETURN
240 LET K$=INKEY$(0)
250 RETURN

```

## MORE IDEAS

This fun game is designed to show you how easy it is to move things on a computer screen.

Use it as a base to build a bigger and better game. Here are just a few ideas for features you could add:

- Put in a timer so you can see how many you can hit in a minute.
- Make the speed of the star slightly different each time.
- Make the arrow start from a different height each time.
- Use your own designs of characters to make it a more realistic game.
- Have some stars going up as well as down.
- Put messages like *open your eyes* in place of the ones we have used. And you could make it print different messages. These would depend on how near the arrow was to the star.

## IS THIS YOUR COMPUTER?

### BBC Micro/Electron/Archimedes

The listing works as shown

### C64/128

Enter the program in capitals.  
Change or add the following lines:

```

20 PRINT CHR$(147)
130 POKE 211,X:POKE 212,Y:SYS 58732
220 GET K$

```

### ST(Stos)/Amiga(AMOS)

Change the following lines:

```

20 KEY OFF : MODE 0
130 LOCATE X,Y
240 LET K$=INPUT(1)

```

Amiga: Use CLS instead of MODE 0

### Amstrad CPC

Change the following lines:

```

130 LOCATE X+1,Y+1
240 LET K$=INKEY$

```

### PC (GW-Basic)

Change the following lines:

```

130 LOCATE X+1,Y+1
240 LET K$=INKEY$

```

### Spectrum

Use 48k mode.

Change or add the following lines:

```

130 PRINT AT Y,X;
240 LET K$=INKEY$

```





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Archimedes,  
and BBC  
only



**Every good game has sound and a high score table. Our ace artist Mike Goldberg puts the final polish on the mega game.**

We're nearly there. Over the last three months we've built a great game between us. Now we'll add the final touch.

First we need a high score table. We've already put in eight dummy names for you. They are in Line 63. If you like you can change these for your own names.

We've also put in some decent sounds. There's an intro tune, a Game over sound and even a tune each time a screen is completed. All the croaks and groans of the

earlier version have been improved.

And there's a new object. Watch out for the lobster! If you touch it you'll be held captive for a while.

The final change is to make the game more enjoyable. Everything you expect to happen is now there.

And it all takes place in the right order. From the intro screen to getting YOUR name on the high score table.

Before adding the new features to your existing program you need to renumber it. How you do this is explained on the right.

Then, just type in the listing and your program will be modified automatically.

The lines printed in red are the new lines you have to add. Blue is for lines that are altered. As for the Line numbers shown in orange, just type these and press Return.

The old lines will be removed. Green areas show you the new procedures and any DATA that goes with them.

The REM lines explain what



they do. When you've made all these changes save the game. But use a different name to the one you used before.

## Game Over

This is the end of the series. But the game's not really complete. It never will be.

You can always add or alter bits. On the right are a few ideas to get you started.

Try these, then think up your own changes.

You'll soon have exactly what you want - until you decide to make it even better!





# Renumbering last month's program

Here's how to renumber last month's program ready to enter this month's extra bits:

- **LOAD** last month's program
- Type **DELETE 10,4130** and press Return so you're left with just the **DATA** lines.
- Save these lines to tape or disc using the following commands:

```
*SPOOL DATA
LIST
```

and after the lines have listed:

```
*SPOOL
```

- **LOAD** last month's program again.
- Type **DELETE 8000,9000** to remove all the **DATA** lines.
- Type **RENUMBER** and press Return
- Put the data lines back (the ones you saved using **\*SPOOL**) on the end of the program by entering:

```
*EXEC DATA
```

- **LIST** the program to check that the main part is numbered from 10 to 2530 and the data is from 8000 upwards. If it is, **SAVE** it. If not, try again - taking care to follow these instructions exactly.

## EVEN MORE IMPROVEMENTS

Your mega game is now complete. Or is it? There is always something else you can do to enhance any computer program.

Here are some ideas to show you how this game can easily be changed. Just add or alter the lines shown:

### MORE BADDIES

```
2210 IFW<12W=W+2
```

### MORE CLOCKS

```
2211 IFn<20n=n+2
```

### EXTRA LIFE EVERY FOURTH SCREEN

```
2212 IF(LXMOD4)=0LX=LX+1:COLOUR128:COLOUR2:PRINTTAB(2,2);LX:FORI=1TO30:SOUND1,-14,RND(90)+90,1:NEXT
```

### PAUSE FEATURE

```
1391 IFINKEY=90REPEATUNTILINKEY=106
```

Press Delete to pause, Copy to restart.

### RANDOM SCREEN COLOURS

```
2213 REPEATa=RND(7):b=RND(7):c=RND(7):UNTILa<>b AND a<>c AND b<>c:VDU19,1,a;0;19,2,b;0;19,3,c;0;
```

### CHANGE SPEED

Remove or alter the delay number at Line 220.

```
31 ENVELOPE1,1,2,4,6,2,4,6,126,-1,-3,-3,126,100
32 ENVELOPE2,3,-4,-8,-4,1,1,1,126,-1,-4,-4,120,120
33 ENVELOPE3,1,1,0,0,200,3,5,126,-1,-2,-2,126,120
34 ENVELOPE4,3,4,-1,-5,8,8,8,126,-1,-3,-4,126,120
35 ENVELOPE5,1,-3,1,4,17,13,50,126,-1,-2,-3,120,110
36 ENVELOPE6,1,90,90,90,40,40,40,126,-1,-2,-3,120,110
37 ENVELOPE7,1,1,3,-71,12,2,20,126,-1,-1,-2,120,100
38 ENVELOPE8,1,-2,0,0,200,0,0,126,-1,-1,-1,0,0
39 ENVELOPE9,3,8,0,-8,12,5,12,126,-1,-1,-4,120,120:ENVELOPE10,4,-4,-8,1,14,14,14,126,-1,-1,-1,120,120:ENVELOPE11,1,1,-1,0,1,1,0,126,-1,-3,-4,126,125
40
41
61 DIMHSX(8),HSS(8)
62 FORI=0TO7:HSS(I)=1250-(I*100):READHSS(I):NEXT
63 DATAPETE,ANDY,YOSSA,MIKE,EDNA,NORA,OWEN,WEND
65 MODE6:VDU19,1,3;0;:GX=0:PROCst
66 PROCtune1
120 ob%=5:DIMob(ob%)
130 no%=8:DIMha(no%)
135 RESTORE150
150 DATA7,64,4,112,240,1,170
155 MODE5:VDU23;8202;0;0;0;19,3,4;0;
240 IFYS=0PROCkeys
241 IFYE=1:IFRND(30)=1YS=0:SOUND1,4,20,1
272 IFend=160TO320
300 *FX21
322 PROCend
323 MODE6:VDU19,1,3;0;:PROCst:MODE5:VDU23;8202;0;0;0;19,3,4;0;
361 go$="GAME OVER"
691 VDU23,240,145,145,165,231,60,102,0,28
692 VDU23,249,24,24,102,153,102,153,36,90
870 o$(4)=K$+CHR$(1+CHR$(246+D$+CHR$(247
871 o$(5)=K$+CHR$(3+CHR$(248+D$+CHR$(249
1231 YS=0
1430
1440
1450 PX=(85800+((X+X)*16)+((Y+Y)*320))
1460 IFPX>0PROCst:IFH=0ENDPROC
1481 SOUND0,-10,2,1
1560
1570
1590
1600 IFU>0PROCbadhit:IFbH=0Z=(Z+1)MOD(W):ENDPROC
1611 IFWP=65SOUND3,6,1,1
1631 SOUND2,-9,190-(Z*8),1
1700 SOUND3,9,88,1
1830 IFPX=ha(I)hI=I
1890 IFH=2SOUND1,1,90,1:PROCscore(500):c=c+1
1910 IFH=4SOUND1,1,190,1:PROCscore(RND(1200)*5)
1920 IFH=5SOUND1,2,60,1:stp=1
1931 IFH=8SOUND1,4,120,1:YS=1
1980 IFbH=1ANDL>0GOSUB2280:PROCdie:IFL>0PROCst
1990 IFbH=2SOUND2,5,55,1:GOSUB2270:PRINTTAB(f,g)CS
```

```
2000 IFbH=3SOUND2,5,200,1:GOSUB2270:PRINTTAB(f,g)CS
2010 IFbH=6ANDW<12LW=W:W=W+2:SOUND2,7,177,1:FORI=LWTOWX-1:GOSUB2270:UX(I)=f:V(I)=g:PRINTTAB(UX(I),V(I)):H$=NEXT
2011 IFbH=8:SOUND2,5,155,1:GOSUB2270:PRINTTAB(f,g)CS
2185 PROCtune2
2301 SOUND0,-13,7,20:SOUND1,8,250,20
2441 SOUND1,3,120,1
2600 REM *** ENDGAME ***
2610 DEFPROCend
2620 *FX15
2630 SOUND1,10,111,1
2635 COLOUR2:COLOUR128:PRINTTAB(4,30)"PRESS SPACE"
2640 REPEAT
2645 FORI=1TOLENGo$
2650 in=INKEY(0):IFin=32GOTO2670
2652 COLOURRND(3)
2655 PRINTTAB(I+4,15)MID$(go$,I,1)
2658 PROCdelay(5)
2660 NEXT
2665 PRINTTAB(5,15)SPC9
2670 UNTILin=32
2690 ENDPROC
2990 REM *** HISCORE ***
3000 DEFPROCst
3010 GOSUB3110
3020 PRINT"SPC8"Your score was ";SX
3030 I=-1:REPEAT:I=I+1:UNTILSX>HSS(I):ORIT=8:IFIT=8GOTO3080
3040 FORJ=7TOI+1STEP-1:HSS(J)=HSS(I)-1:HSS(I)=HSS(J-1):NEXT:HSS(I)=SX
3050 INPUT"Enter name "N$
3060 HSS(I)=LEFT$(N$,8)
3070 GOSUB3110
3080 *FX15
3090 PRINT" Press SPACE to play again ...":REPEATUNTILGET=32
3100 ENDPROC
3110 CLS:PRINTTAB(11,1)"HI-SCORES":FORI=0TO7:PRINTTAB(6,I*2+4);HSS(I):TAB(28-(LENSTR$(HSS(I))),I*2+4);HSS(I)
3120 NEXT:RETURN
3200 REM *** TUNE1 (Intro) ***
3210 DEFPROCtune1
3220 RESTORE3500
3230 FORI=1TO34
3240 READN,D
3250 SOUND1,11,N+48,D
3251 PROCdelay(2)
3252 SOUND2,11,N+49,D
3260 NEXT
3280 ENDPROC
3500 DATA49,2,61,2,61,2,61,2,53,4,49,2,61,8,61,2,69,2,53,2,69,2,81,2,77,2,69,2,61,8,61,2,69,2,53,2,69,2,81,2,77,2,69,2,61,2,69,2,61,2,49,2,33,2,49,2,61,2,61,2,61,2,69,4,77,2,81,2
3600 REM * TUNE2 (Complete a screen) *
3610 DEFPROCtune2
3615 RESTORE3700
3620 FORI=1TO11
3630 READN,D
3640 SOUND1,11,N+20,D
3650 PROCdelay(2)
3660 SOUND2,11,N+21,D
3670 NEXT
3680 ENDPROC
3690 ENDPROC
3700 DATA89,2,85,3,77,2,69,3,61,2,57,3,49,2,41,3,57,2,69,3,89,2
```

## ALL THE OBJECTS OF THE MEGA GAME

LOBSTER



CLOCK



BOMB



BONUS



SWITCH



TWO'S



THUMBS-UP







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You can find out how to join the Club on Page 32 - and about all the other goodies sent out to members.

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# KNOT LOGO? Oh yes it is!

When Terry Turtle joined the scouts he was asked to tie a reef knot. But as you would expect, being a very modern turtle, he didn't need rope.

He used his computer and the language Logo. Here's how he drew his first knot.

First he wrote a procedure which he called CURVE. He did this by entering:

TO CURVE

Then he keyed in the instructions to tell his computer how to draw a curve. You can see what he wrote in the first three lines of the listing on the right.

To try this (and the rest of Terry's program) you first need to run the Logo Language. This is available for most computers.

If you haven't got one and you're using an Acorn computer the Let's Compute! Turtle Logo is an ideal starting point - see the offer on the left.

Type in the three lines and test them by entering:

CURVE 2

The number 2 is the size the curve. (Try others like 1, 2 and -2 and see what happens.)

Next, Terry wrote the procedure LOOP. This drew one part of his knot - a U shape on its side. Type it in and try it by keying:

LOOP 400 2

It uses the procedure which we've called CURVE. So remember you must key that in first. If you change the numbers you'll draw different sizes of loop.

He decided that now he had

the two main procedures the rest was as easy as one, two, three - so that's the names he used for his procedures. Here's what they do:

● ONE draws two parallel loops inside each other. This gave his rope thickness.

● TWO draws another loop of rope pointing the other way. It stops where it hits the first. This gives the effect of it going under.

● THREE draws the ends of the second loop. That's when they show again after going under the first.

Finally, Terry wrote a procedure he called KNOT. This uses his other procedures.

So, to draw Terry's knot you should key in the listing alongside. Then SAVE it by entering:

SAVE "KNOT

To see Terry's knot, just key:

KNOT

But oh dear! Terry may be able to program in Logo but he can't draw knots very well.

He's ended up with two bits of string on top of each other. It looks great, but it isn't the reef knot he set out to draw.

Can you help him? If you can draw a reef knot - or any other knot - send us a listing of your program. We'd also like a copy on tape or disc, and please let us know which version of Logo you used.

Post it to Let's Compute! Adlington Park, Macclesfield SK10 4NP. There's a super Let's Compute! baseball cap for the writer of every one we print.



```
TO CURVE :SIZE
REPEAT 90 CFD :SIZE RT 12
END
TO LOOP :DIST :SIZE
PU RT 90
BK :DIST PD
FD :DIST
CURVE :SIZE
CURVE :SIZE
FD :DIST
END
TO ONE
HOME PU FD 200 PD
LOOP 400 4 PU
HOME PU FD 145 PD
LOOP 400 3 PU
END
TO TWO
HOME PU
RT 180 FD 140 PD
LOOP 120 2 PU
HOME PU
RT 180 FD 85 PD
LOOP 150 1 PU
END
TO THREE
HOME PU
RT 180 FD 140 LT 90
FD 205
PD FD 195 PU
LT 90 FD 55 LT 90
PD FD 170 PU
RT 90 FD 115 RT 90
PD FD 170 PU
LT 90 FD 60 LT 90
PD FD 195
END
TO KNOT
HOME CLEAN
ONE TWO THREE
HT
END
```



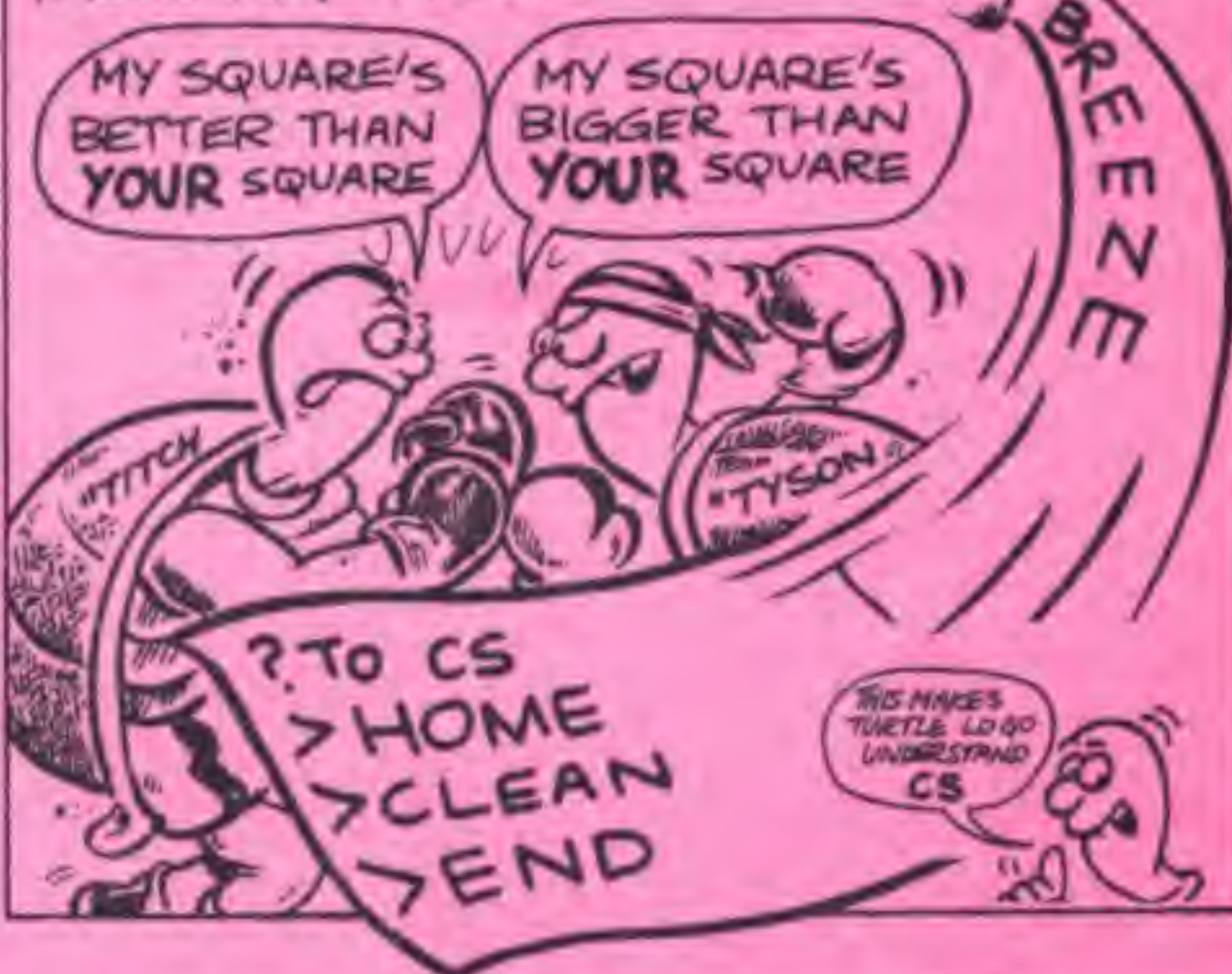
# LOGO LOWDOWN

BY MICHAEL NOELS

Q: WHAT DO YOU BLOW UP TURTLES WITH?



LAST MONTH THERE WAS TURTLE TROUBLE IN THE PLAYGROUND. TITCH WAS THUMPING TYSON!



TITCH HAD USED TURTLE ORDER TO TO CREATE THE PROCEDURE SMSQ



```
? TO SMSQ
> REPEAT 4 [FD 100 RT 90]
> END
```



SMSQ STANDS FOR SMALL SQUARE

TYSON WANTED A BIGGER SQUARE. HE USED:

```
? TO BIGSQ
> REPEAT 4 [FD 200 RT 90]
> END
```

I BET YOU KNOW WHAT BIGSQ STANDS FOR



200

MISS TEACH MADE THEM STAY IN AND SHOWED THEM WHAT THEY COULD DO IF THEY CO-OPERATED

```
? TO BOTHSQ
> CS
> REPEAT 8 [RT 45 BIGSQ SMSQ]
> END
```

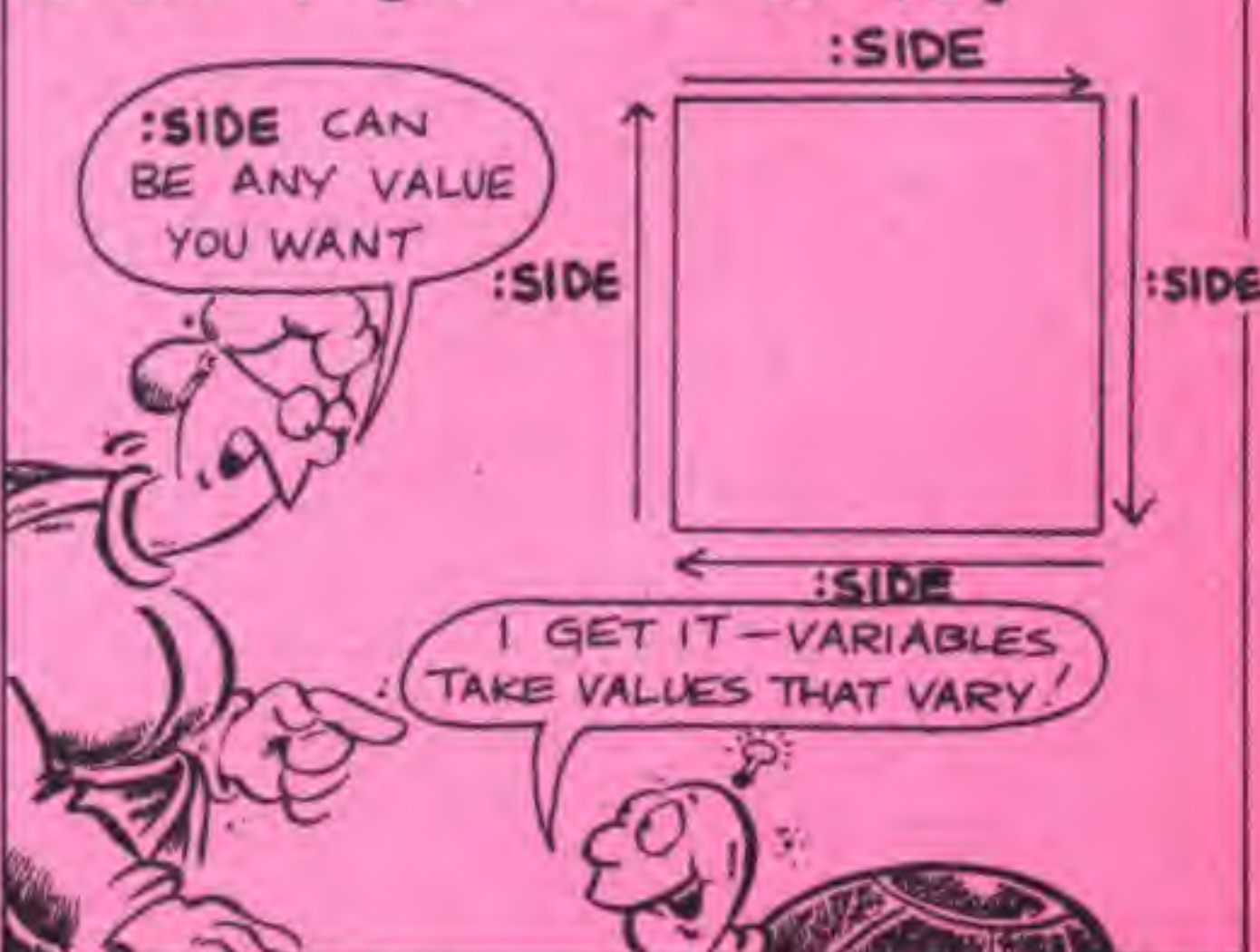


MISS I WANT A LOT OF SQUARES WITH DIFFERENT LENGTH SIDES. DO I HAVE TO USE LOTS OF TOs?

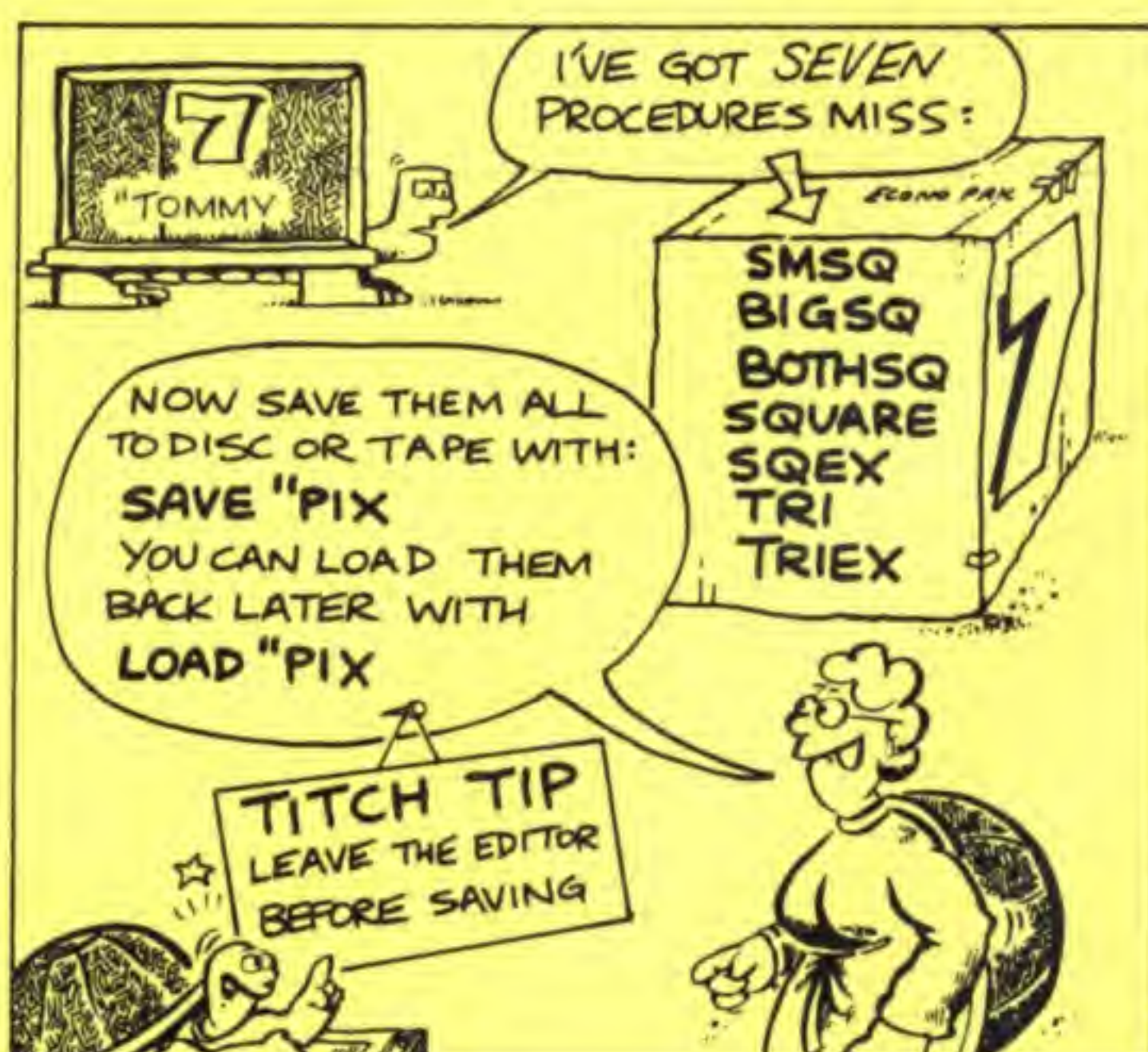
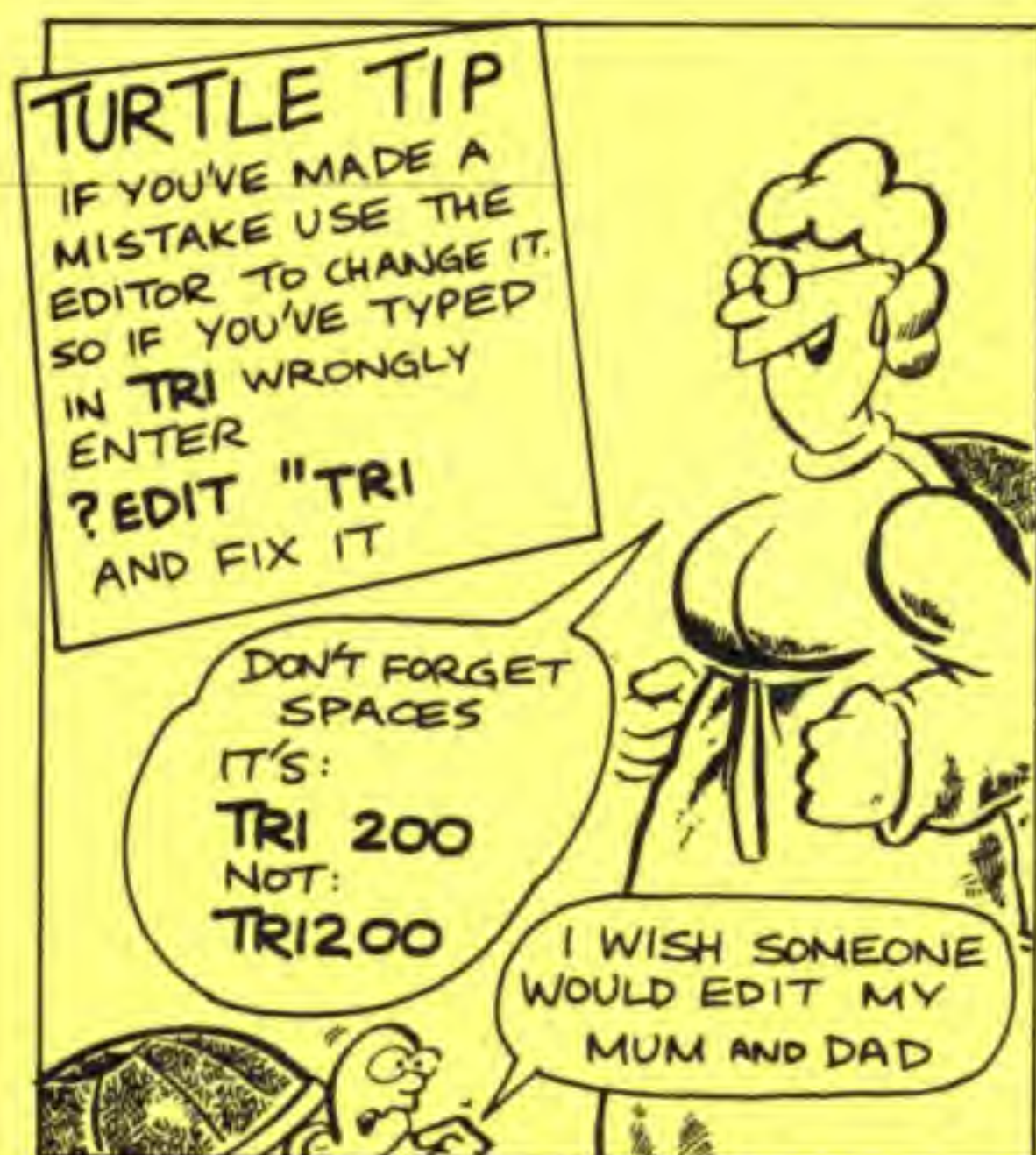
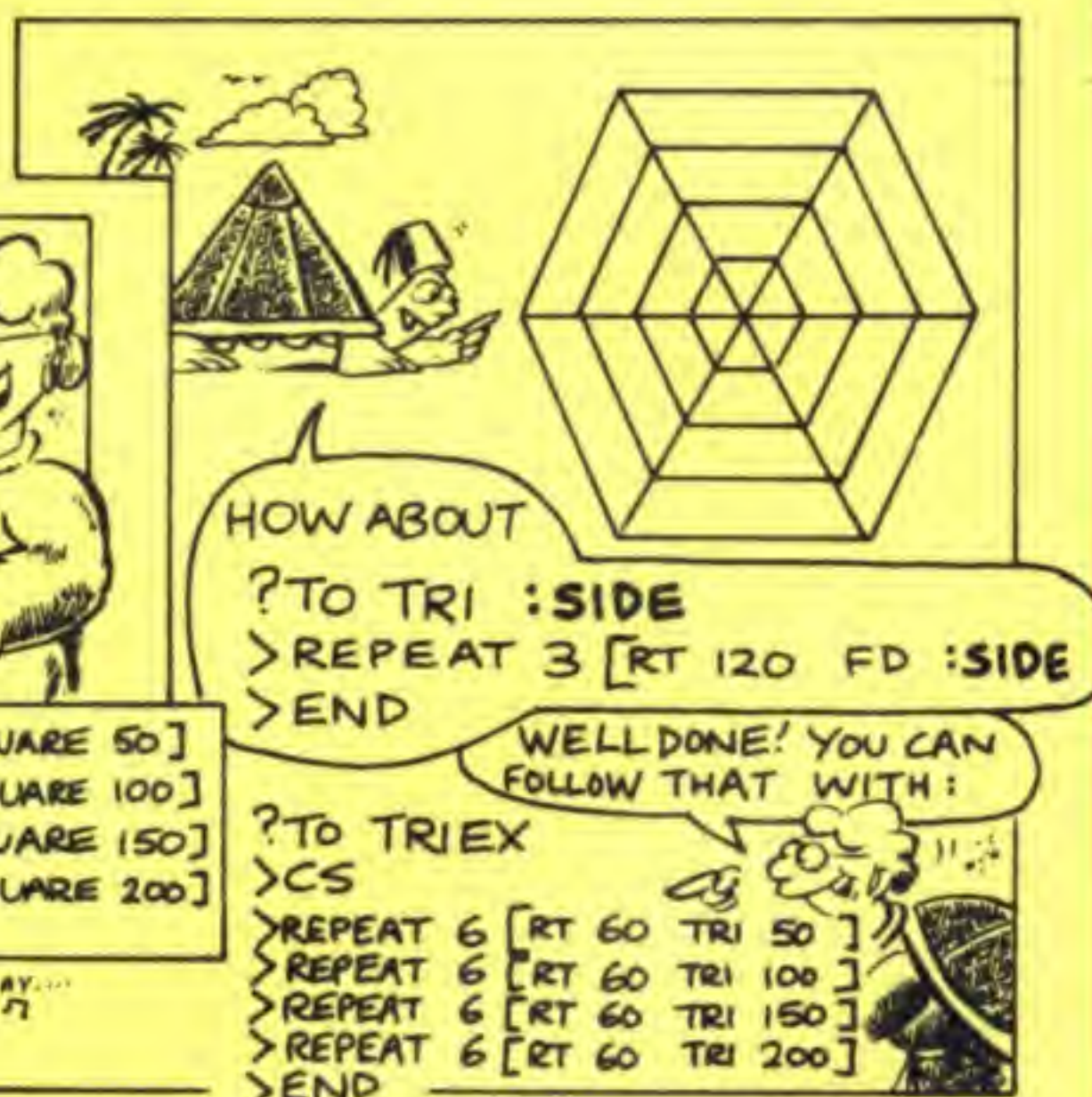
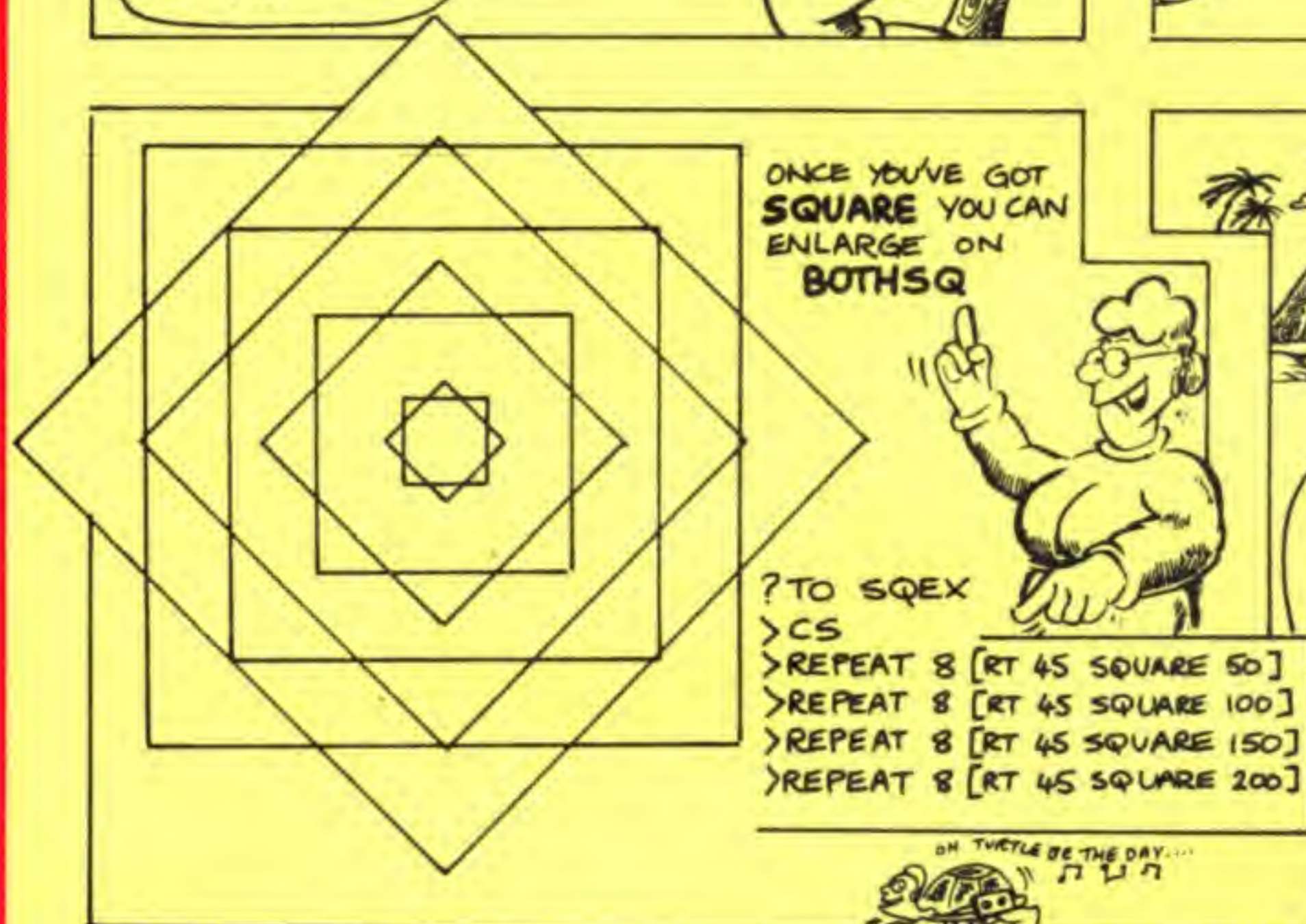
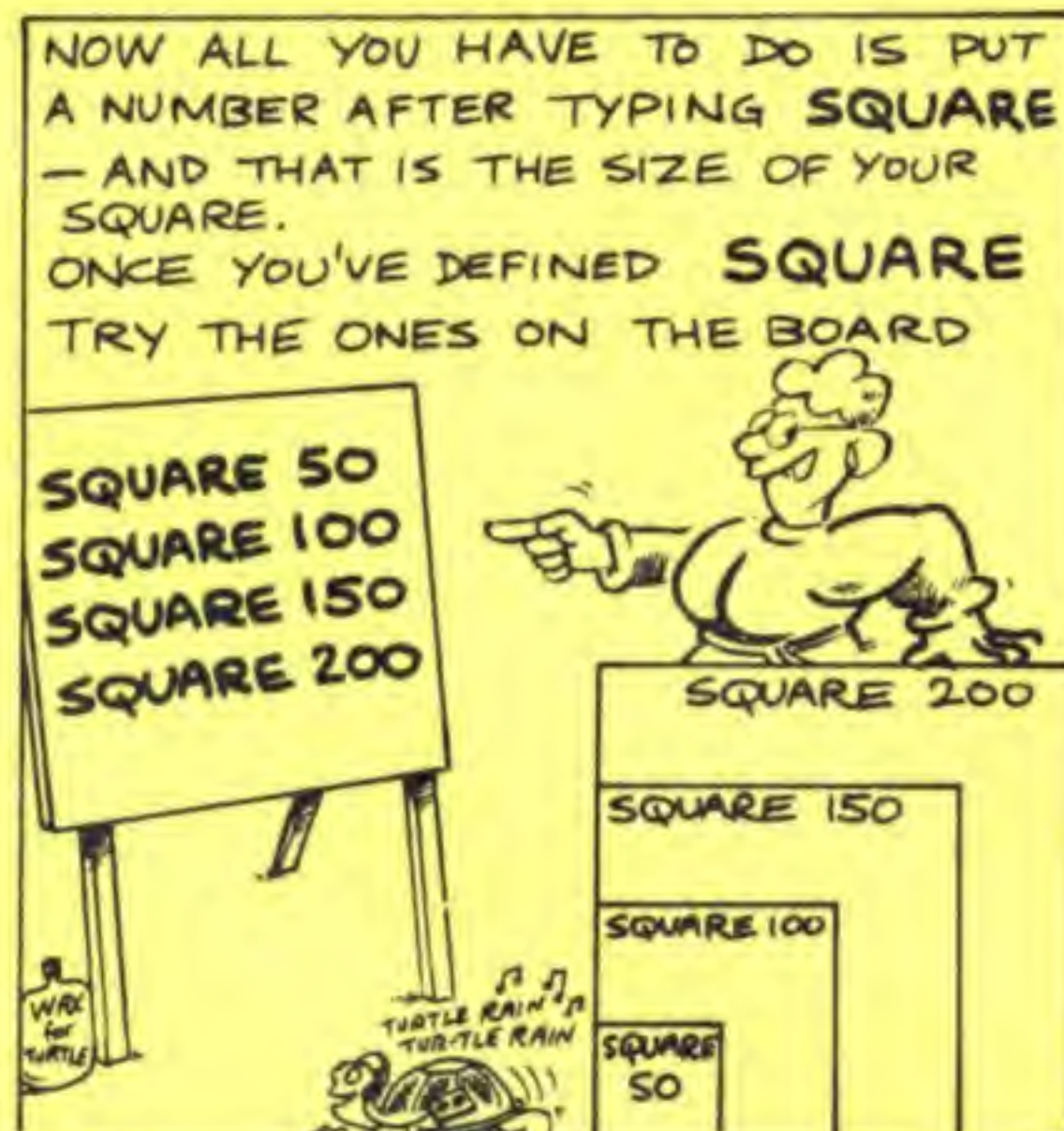
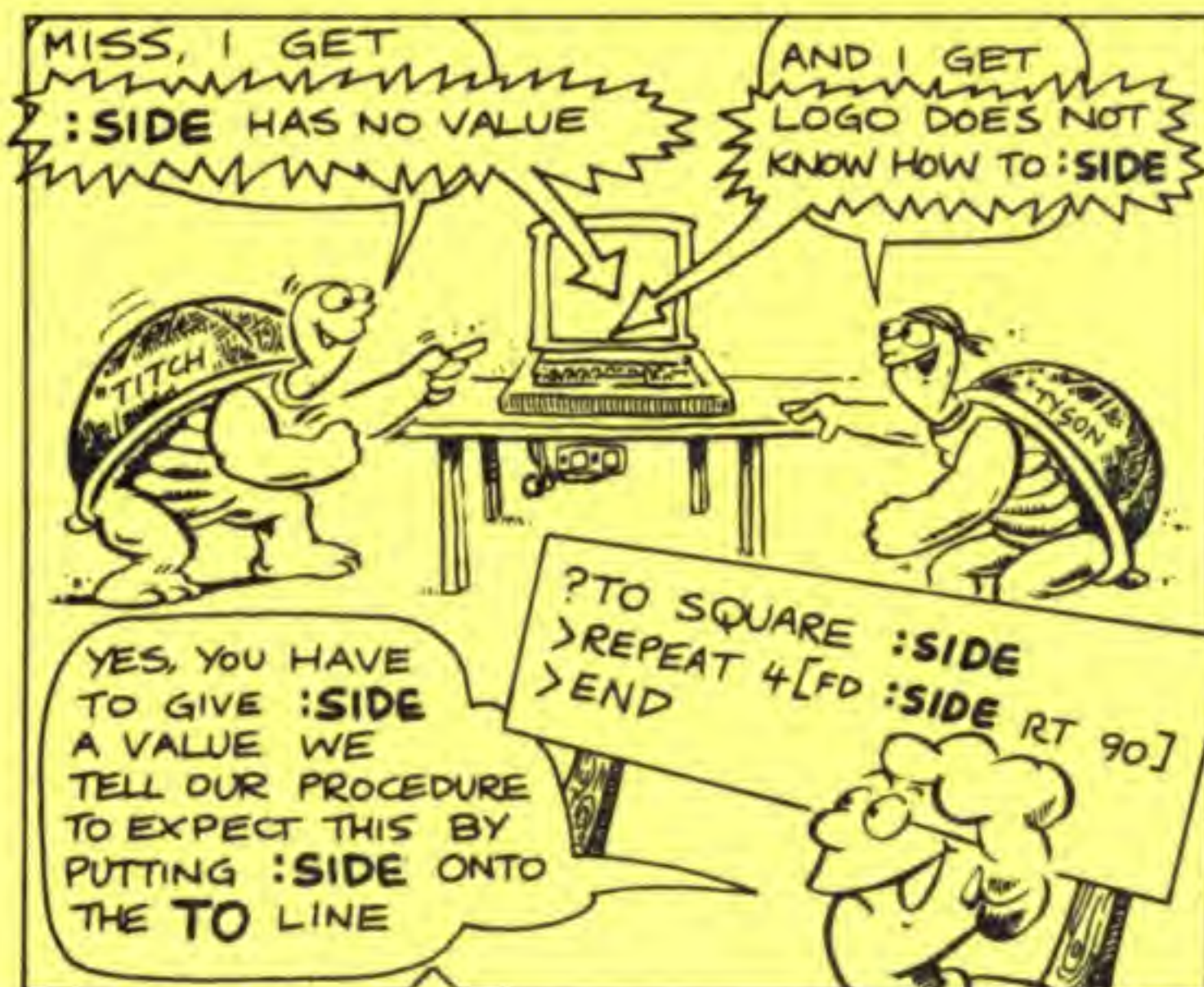


INSTEAD OF WRITING 100 OR 200 IN OUR PROCEDURE PUT :SIDE IN ITS PLACE. SO A COMMAND FOR A SQUARE WOULD LOOK LIKE:

```
REPEAT 4 [FD :SIDE RT 90]
```









LOGO IS GOOD AT ART BUT CAN IT DO SUMS AS WELL?

**"SPACES!!"**

```
PRINT 1 + 1
PRINT 20 + 30
PRINT 20 + 30 + 50
PRINT 1 - 1
PRINT 50 - 20
PRINT 100 - 30 - 20
```

YES-TRY THE ONES ON THE BOARD

LEAVE OUT PRINT AND SEE WHAT HAPPENS

TERESA

# TURTLE PROFILE

## TYKE TURTLE

-PUNK!

**FACTS:**  
 HEIGHT: TALL  
 EYES: PIERCING  
 HAIR: MOHICAN  
 CLOTHES: LEATHER  
 LIKES: NO ONE  
 DISLIKES: EVERYONE  
 FAVOURITE FOOD: WORMS  
 HOBBIES: POGO-ING, SCOWLING  
**TYKE SAYS:**  
 "GET LOST!"

THOSE ARE BABY ADDS AND TAKE AWAYS. CAN YOU DO MULTIPLIES AND DIVIDES?

YES, BUT INSTEAD OF X FOR MULTIPLY WE USE \*

```
PR 6 / 3
PR 100 / 4
PR 1 / 2
PR 9 / 3 / 3
```

AND INSTEAD OF ÷ WE USE /

SO PR IS SHORT FOR PRINT IS IT?

```
PR 2 * 2
PR 4 * 40
PR 3 * 3 * 3
PR 100 * 100
```

LOGO CAN EVEN REMEMBER NUMBERS. IT GIVES THEM NAMES. FOR FUN WE'LL GIVE OUR NUMBER THE NAME **NUMBER**—SO WE WON'T FORGET WHAT IT IS. HERE'S HOW TO DO IT

```
MAKE "NUMBER 100
PR :NUMBER
```

YOU CAN NOW DO SUMS WITH **NUMBER**. TRY THESE

```
PR :NUMBER + 10
PR :NUMBER / 2
PR :NUMBER + :NUMBER
```

oops! I'M EARLY

**:NUMBER**

WHY DO YOU PUT " AND : IN FRONT OF **NUMBER** AND THE OTHERS?

WELL, "**NUMBER**" IS JUST A CONTAINER SO YOU PUT " IN FRONT TO SHOW THAT. **:NUMBER** IS WHAT'S INSIDE THE CONTAINER.

TEACH

IF YOU LIKE, "**NUMBER**" IS THE SHELL AND **:NUMBER** IS THE TURTLE INSIDE IT.

I'D HATE ANYONE TO SEE ME WITHOUT MY SHELL!

YES, I'M ONLY **:TOMMY** WHEN I SUNBATHE

NEXT MONTH THE ABC OF DOING SUMS.



# The Games Gang

## Film Fun

As Christmas is getting near, all the big software houses are bringing out new games. And lots of them are follow-ups to old ones.

Keep your eyes peeled for **RoboCop 2**. It's due out from Ocean soon. It should feature much the same mix of blasting and puzzles as the original.

The **Gremlins 2** licence has been snapped up by Elite. But there are still not many details about how the game will turn out.

If it's anything like the film, you can be sure it will be set in a building and feature most of the cute mutant Gremlins.

## Rick's Back

Rick Dangerous, the superhero with the Flash Gordon shirt and blond quiff, is back again. **Rick Dangerous 2** is on all formats and has been released by Microprose.

There are five levels of the same frustratingly addictive platform and shooting action as the original. It costs £9.99 (8-bit) and £24.99 (16-bit).

## Speedball 2

The Bitmap Brothers and Mirrorsoft are about to release a follow-up to **Speedball**. It should be another ace multi-format sport game set in the future.

It's basically a cross between rollerball and football.

There are two teams of nine-a-side and loads of extra features like bonus pick-ups, warp gates and a management section.

But the best aspect is that there are no rules. You can be as violent as you want! Check it out in late November – it should be one of the best games of the year.

## Charlie's Cheats!

**Castle Master** on the PC, ST and Amiga has a built-in cheat mode: As soon as you've started, don't move.

Look straight down (Shift+L). Press the right (action) button 12 times (ST, PC) or 25 times (Amiga) until you hear a noise.

Then look straight forward. You'll see four coloured squares on the ground. Throw rocks at these to gain infinite revitalisation, all 10 keys, rock travel and the end game sequence.

On the PC version you can get all 10 pentacles instead of the end game sequence.

## All together now!

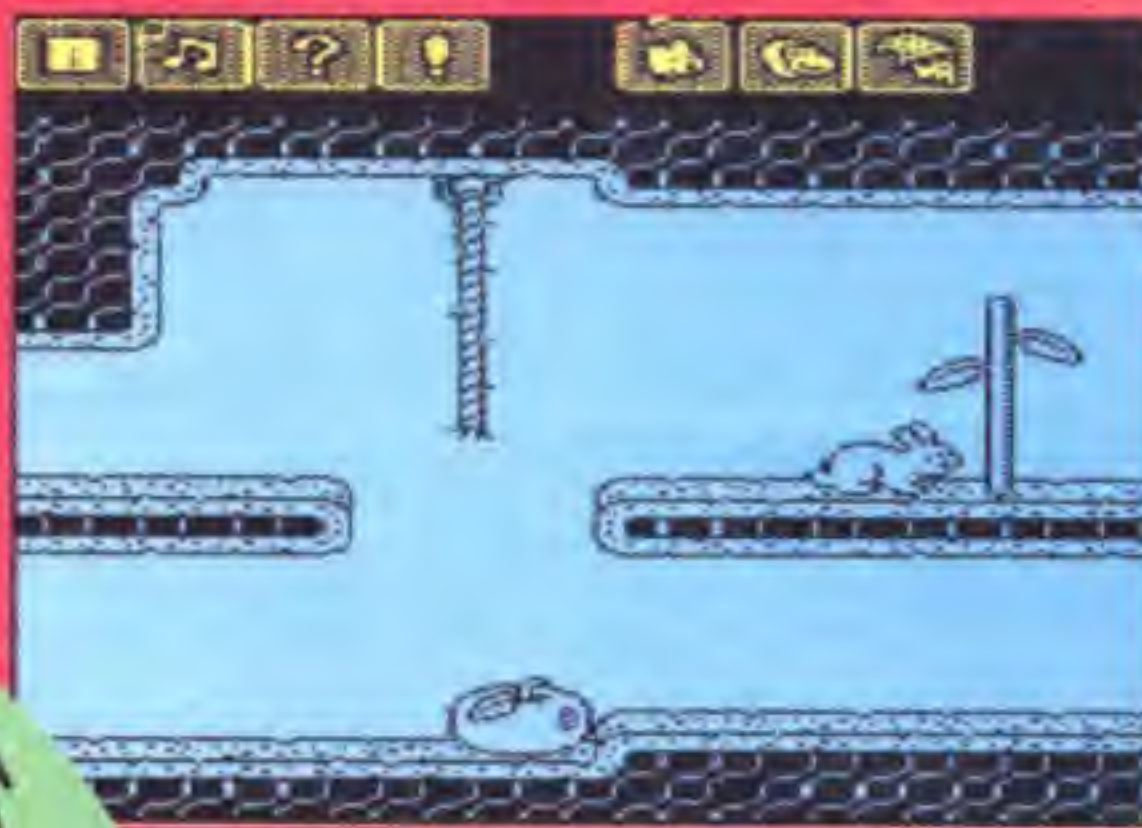
The latest compilation to appear on the ST, Spectrum, Amiga, CPC and C64 is **Edition One**. It's from Virgin and costs £12.99 on tape or £24.99 on disc.

It contains four games: Double Dragon, Silk Worm, Xenon and Gemini Wing. The first is the classic oriental combat game for one or two players.





# Pam's passwords



## IMOGEN

Nilesh Barchha aged 12 from Bramhall must have been glued to his BBC to find all these passwords:

Balloonacy  
Baboonacy  
Time-flies  
Fire-works  
Saxaphobia  
Duck-egg-blues



## HOSTAGES

Gary Ashwell from Kempston has found a way to foil the terrorists evil plan in Hostages. Here are the passwords: Penultin, Maxituff

# Helpful Harry

**Fish!** is an adventure game that you can get for lots of computers. Colin Batchelor from North Berwick has sent *Let's Compute!* some helpful advice.

When you're in the city of Hydropolis you'll need the focus wheel you assembled earlier. If you find page 156 of a book in the Library, pop this into the photocopier. You'll be rewarded with the part.



## BARGAIN BUYS!

The biggest budget news this month is for 16 bit computer owners. Ocean are about to release a back catalogue of games for the ST and Amiga.

Titles will include **Wizball**, **Batman the Caped Crusader**, **Arkanoid 2**, **Afterburner**, **Super Hang On**, **R-Type** and **The Last Ninja 2**. They'll cost £7.99 each.

Spectrum, CPC and C64 owners can look forward to a budget licence based on the Aussie soap, **Neighbours**. It's due to be released by Zeppelin soon and will cost £2.99.

If you've got any hints, pokes or cheats you'd like us to print send them in to us at:  
**Let's Compute! Europa House, Adlington Park, Macclesfield SK10 4NP.**



# KEYBOARD KAPERS



## ★STAR CAT★



## The Micro Kid





# THE PROGRAM DOCTOR



The program below is intended to put two numbers in order. When Doc saw it he had just three comments:

- What if the numbers are the same?
- What if you want to sort just more than two numbers?
- Who would want to sort two numbers on a computer?

So he threw it away and wrote the second program. It sorts as many numbers as you want.

Just type it in and RUN it. You'll first be asked how many numbers you want to sort.

Give the answer and you will see a question mark. You now have to type in the numbers you want to sort, one after the other.

After you have keyed in the last number there is a short pause. Then the program will display the numbers in order.

It's not the fastest way of sorting numbers. But it's short and much better than the original program.

We'll be looking at other ways of sorting things in future issues of *Let's Compute!*

*There's always a better way of doing things! Here's another program just waiting to be operated on. Our resident micro medic diagnoses several shortfalls.*

## This is the original program:

```
10 INPUT A,B
20 IF A>B THEN PRINT A,B
30 IF A<B THEN PRINT B,A
```

## How the Doc altered it:

```
10 INPUT "HOW MANY";LS
20 DIM J(LS)
30 FOR L=1 TO LS
40 INPUT J(L)
50 NEXT L
60 LET FS=1
70 LET PU=J(FS)
80 LET FS=FS+1
90 FOR P=FS TO LS
100 IF PU<J(P) THEN LET IT=J(P):LET J(P)=PU:LET PU=IT
110 NEXT P
120 LET J(FS-1)=PU
130 IF FS<LS THEN GOTO 70
140 FOR L=1 TO LS
150 PRINT J(L)
160 NEXT L
```

*This program works on all home micros*

## TRY THIS

There is a short pause between typing in the last number and the sorted numbers being displayed. Time the pause for sorting several different sets of numbers.

Does it take twice as long to sort 20 numbers than 10? Does it take half as long to sort 25 numbers than 50? Is there any pattern to how long it takes?

Time the program for several sets of numbers. You could draw a graph of the results.

And why not check whether the pause is shorter if the numbers start off in order rather than mixed up? Does it take longest to sort numbers that start in reverse order?

## How the Doc's program works

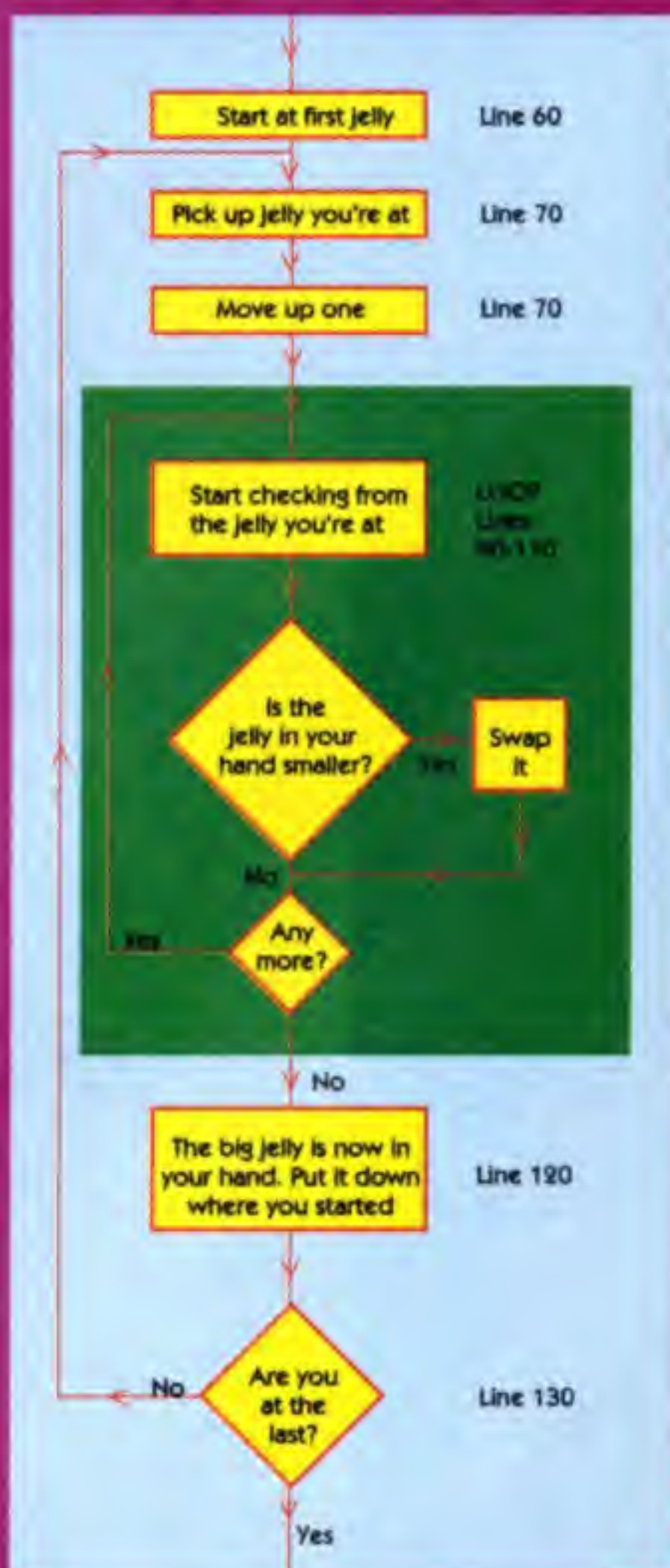
The doctor first worked out how to sort numbers when he was at a party. He wanted the biggest jelly.

He was first in the queue, ready to walk down a row of jellies and pick the biggest. But the only way he could make sure he got the biggest was to pick up the first and walk along the row of jellies, swapping the one in his hand with any bigger ones he saw.

When he got to the end, he went back to his position and guarded his jelly. The second person then went looking for the biggest remaining. He started his search at the second place and returned there when he had found the biggest.

The next in line – and then the third, fourth, fifth and so on – did the same. And this program works just like that.

Lines 10 to 50 and 140 to 160 read in and print out the numbers. The rest of the program does the sorting. This flowchart explains how it works:



Do you think YOU'VE written a program that can't be improved? Then send it along to the Program Doctor. He loves a challenge!



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● Then post your entry to **Let's Compute!** to arrive no later than November 20.

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